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Volume XX December, 1930 Number 12

Time, Coöperation and Research Measure Success in Health Work*

A. J. CHESLEY, M. D., F. A. P. H. A.
State Health Officer, St. Paul, Minn.

THE slogan: "All things come to him who waits" is all right for a "tree-sitter," but Lindbergh preferred the World War slogan: "Let's go!" "It won't be long now," the newspapers said, when Lindbergh took off to cross the sea or die. The instant he landed, the Eifel Tower wireless flashed the news to Arlington. The War Department offices were notified first. At that moment a delegation of state health officers accompanied by Dr. Maurice Seymour, of Saskatchewan, President of the Conference of State and Provincial Health Authorities of North America, and led by the President-elect, Dr. Samuel Welch of Alabama, was making a plea in the War Department Office to General Lord, Director of the Budget, for additional funds to be used for health work in the flooded Mississippi valley. General Lord interrupted Dr. Welch, answered the telephone and repeated the thrilling message: "Lindbergh has landed in France."

Of those present, General Lord, Dr. Seymour and Dr. Welch have crossed the Great Divide. The others have a lasting and vivid mental picture of that incident. It emphasized the facts that distance is now measured by time alone; that natural barriers to disease importation no longer exist; and while new safeguards are needed the new potential hazards of disease spread are offset by easy and almost instantaneous communication between remote parts of the world. Today, October 27, regular commercial service between North America and Australia was begun by the American Telephone and

* Address of the President of the American Public Health Association, delivered at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

Telegraph Company. The wire lines between New York and Sydney stretch over 14,000 miles and radio spans the seas.

Airplanes for investigation and wireless broadcasting of the facts concerning epidemics or threatened epidemics save time. These agencies are available for international and national, and in a few places, for state or provincial use, and should be universally adopted. They give the health authorities and allied agencies time to prepare a successful campaign for prevention or control. Their proper use by epidemiologists and other trained public health personnel will save lives, and prevent sickness and economic loss.

Reciprocal notification of epidemic diseases dates from 1879 when Dr. Charles N. Hewitt, Secretary of the Minnesota State Board of Health, Charter Member of this Association and its president in 1888, arranged for interchange of information between Minnesota, the province of Manitoba, the territory of Dakota and the states of Wisconsin and Iowa. Dr. Hewitt visited Canadian quarantine stations and, assisted by Dr. Frederick Montizambert, later Director General of Public Health of Canada and president of the American Public Health Association in 1891, entered into an agreement for reciprocal notification between Minnesota and the different Canadian ports which at that time did not report to each other but only to the Dominion headquarters office.

Cholera, plague and yellow fever led 12 European nations in 1851 to exchange information and adopt uniform preventive measures. These diseases were the primary concern at the Philadelphia Conference of 1857 called by the Health Boards of New York, Philadelphia, Boston, Baltimore and New Orleans, and attended by 73 delegates from 9 Atlantic states representing 26 boards of health, boards of trade and medical societies of the principal seaboard cities. This "Quarantine and Sanitary Conference" met in 1858, 1859 and 1860. In 1861 the Civil War interrupted its work.

The cholera epidemic of 1866 enabled the newly organized Metropolitan Board of Health to demonstrate its efficiency and paved the way for state legislation. The Massachusetts State Board of Health was established in 1869, the California Board in 1870, the Minnesota Board in 1872.

It is interesting to note that in 1872 when the American Public Health Association was organized Canada was represented by Dr. William Marsden of Quebec on the Committee on Permanent Organization, of which Dr. Stephen Smith was chairman; Massachusetts by Dr. George H. Derby, Secretary of the State Board of Health; the United States Army, the Navy and the Marine Hospital Service by medical

officers; while the other members represented Alabama, California, Connecticut, Illinois, Louisiana, Missouri, New York, Ohio, Pennsylvania, South Carolina, West Virginia, and the District of Columbia. Among the 67 members elected before the constitution was adopted were Dr. Phillip Carpenter of Montreal, Dr. Thomas M. Logan, Secretary California State Board of Health, Dr. Charles N. Hewitt, Secretary Minnesota State Board of Health, and Dr. George W. Peate, Health Officer of Galveston, Tex.

At the American Public Health Association meeting of 1875 a communication was read from the Secretary of the Association of Health Officers of the Lower Rhine requesting to be put in full fellowship with the Association for mutual interchange of publications. The American Public Health Association named ten delegates to attend the International Medical Congress at Philadelphia in 1876.

Thus coöperation and reciprocal notification in communicable diseases was begun here and abroad. Later, international organizations, official and nonofficial, relating to every phase of public health and welfare sprung up.

At least two Canadians helped organize the American Public Health Association in 1872, but Canada did not officially join until 1884. Five distinguished Canadian sanitarians have been presidents —Dr. Frederick Montizambert, 1891; Dr. Emmanuel Lachapelle, 1894; Dr. Peter H. Bryce, 1900; Dr. Robert M. Simpson, 1911; and Dr. Charles J. Hastings, 1918. Four times the standing and annually reiterated invitation from Canada to meet in one of her cities has been accepted—Toronto, 1886; Montreal, 1894; Ottawa, 1898; and Winnipeg, 1908. In 1889, Mexico, Cuba, Colombia and the Central American countries were invited to join. In 1890 the Superior Board of Health of Mexico sent delegates, and in 1902 Cuba entered the Association.

Dr. Eduardo Liceaga joined the Association in 1891, became president in 1896 and always took an active part in its affairs. To honor him the Association met in Mexico City in 1892 at the invitation of President Diaz, himself an Honorary Life Member. In his presidential address at Mexico City in 1892, Dr. Felix Formento said: "This is the first real International Health Congress on this side of the Atlantic." Dr. Domingo Orvananos, Delegate in 1890, was elected president at the second meeting held in Mexico City in 1906.

Dr. Carlos J. Finlay of Cuba, "the first to affirm the mode of transmission of yellow fever by means of the mosquito," was our president in 1904 and presided at the meeting in Havana in January, 1905. In 1911 the Association returned to Havana. Those fortunate members

who attended the meetings in Canada, Mexico, and Cuba, will certify that the facilities provided for the sessions and the quality of the reception cannot be excelled. Dr. Aristides Agramonte, whose name always will be associated with Finlay, Reed, Carroll, Lazear, Gorgas, and Guitéras in connection with yellow fever will address the Association at the final session Thursday evening, October 30.

Through the application of the results of the work of these great men, yellow fever—which for more than a century retarded our development, caused great loss of life, and forced upon infectible territories a system of drastic, highly individualized quarantines that cost hundreds of millions of dollars in delays to commerce—was first rationally dealt with from a quarantine standpoint, by the First Pan-American Sanitary Conference which met in Washington in 1902. Since that time this disease has been eradicated from all its strongholds in America save Brazil and—barring the possibility of its reintroduction by the rapid development of airplane traffic—ceases to be the dreaded scourge that it was in former times.

The Second Pan-American Conference, in 1905, adopted a treaty known as the Washington Convention which was a great step in advance in standardizing international quarantine procedures in America and abroad. The Washington Convention was the precursor of the present Pan-American Sanitary Code adopted in Havana in 1924 and since ratified by 17 American republics. This Code further unifies and standardizes our international procedures in the field of public health and obligates the signatory powers to report promptly all outbreaks of quarantinable diseases and the measures being taken for their control.

When the proposal to establish the Office International d'Hygiène Publique was accepted in 1907 by 12 European nations and the United States, Dr. Allan J. McLaughlin of the U. S. Public Health Service, president of the American Public Health Association in 1922, was the delegate of our government. This agency, set up at Paris in 1908, placed official coöperation on a permanent international basis and, through its relations with the Health Section of the League of Nations, information regarding outbreaks of quarantinable diseases is immediately available as they occur, practically throughout the entire world.

The directors of health from 21 American Republics will meet in Washington in 1931, and then attend the 46th annual Conference of State and Provincial Health Authorities of North America and the 28th annual Conference of State and Territorial Health Officers with the U. S. Public Health Service.

All Canadians who belong to the American Public Health Associa-

tion are members of the Canadian Public Health Association. They are as active and loyal in this Association as in their own. The same may be said of the members of the Conference of State and Provincial Health Authorities of North America; yet when the first Conference of State Health Officers was held at the time of the American Public Health Association meeting in 1884 some people feared that the Association would be weakened through withdrawal of representatives of state boards of health therefrom. The objectives of the Conference of State Health Officers are stated in the report of the Minnesota State Board of Health for 1883–1884 by Dr. Hewitt, who proposed the organization in 1879. They are very similar to those of the new International Association of Medical Health Officers about which there is now some apprehension.

While I venture no recommendation on matters of policy or of administration of the American Public Health Association, I believe that we should act with the courage of our convicitions now and have faith in the future of the Association. A review of the history of our Association since its organization in 1872 shows that it has not yet attained the place its founders and sponsors marked for it.

In 1929 the Governing Council adopted a plan which places responsibility for administration upon the Executive Board and four standing committees: Fellowship and Membership, Meetings and Publications, Administrative Practice, and Research and Standards.

In June the Western Branch of the American Public Health Association met at Salt Lake City and ratified the Constitution and By-laws prepared by a committee appointed by Dr. W. C. Hassler and approved in principle by the Executive Board April 4, 1930. A program of great interest and value arranged by Dr. Hassler and Dr. William P. Shepard, Secretary, was carried out, and the enthusiastic appreciation, by the large assembly, of the hard work of Drs. Hassler and Shepard in building up the membership convinced everyone that the Western Branch will grow and be the means of speeding the progress of health work in the mountain and Pacific states and western Canada. Dr. H. M. Bracken, State Health Officer of Minnesota, 1897–1919, and since in Veterans' Bureau service and with the Los Angeles Health Department, now edits the Health Section of the *Western Hospital Magazine* which has been made the local organ for the Western Branch.

Reports of the work of the four standing committees and of the Salt Lake City meeting have been made to the Governing Council. A special committee named by the Chairman of the Executive Board at its last meeting reports to the Governing Council as follows:

THE AMERICAN PUBLIC HEALTH ASSOCIATION
ITS OBJECTIVES AND A PLEDGE OF THEIR ATTAINMENT

Our permanent objective is the effective control of preventable disease, and the security of health for all the people of our countries.

The first necessity to attain this objective is:

A full-time health service with trained personnel for every community and provision of adequate public funds for its support.

The first fruits of such organization and support of public health knowledge and resources will be:

1. Reduction of the maternal mortality rates so that the United States and Canada will be second to no nation in the safety of motherhood.
2. Securing normal growth of body and mind for children, and their training in the laws and personal practices of a healthy life.
3. Protection of life and limb and promotion of health for the working man and woman.
4. An adequate supply of safe milk for every community.
5. An adequate supply of pure water for every community.
6. Elimination of tuberculosis, malaria, hook-worm disease, typhoid fever, diphtheria and smallpox among the communicable diseases of which we have sufficient knowledge.

The American Public Health Association pledges to the health workers and to the people of our member nations vigorous coöperation in carrying these projects to a successful conclusion.

May I suggest that when you consider these reports you read again the address of President Fuller, and 3 other articles published in our JOURNAL:

1. Coöperation and Coördination of Voluntary Public Health Organizations, by Frederick R. Green. January, 1915.
2. Teamplay in Public Health, by George E. Vincent, President of the Rockefeller Foundation. January, 1919.
3. The American Public Health Association, Present, Past and Future, by W. S. Rankin. April, 1920.

If you do so, I think you will agree that while another year of experience is needed to determine whether the present plan is satisfactory, the early adoption of certain measures for the advancement of the Association is very desirable. The Association program for study and improvement of Administrative Practice has had a considerable and direct effect upon the organization of health work in the United States and Canada and in many countries abroad. Without the generous contributions from the Metropolitan and other life insurance companies, the Commonwealth Fund, and the Milbank Memorial Fund, the Association would not have been able to initiate this work or to provide for its continuance.

Certain recent events indicate that the present public health situation is better and its future brighter than ever. For example, President Hoover said in his message to Congress December 4, 1929:

> The advance in scientific discovery as to disease and health imposes new considerations upon us. The Nation as a whole is vitally interested in the health of all the people; in protection from spread of contagious disease; in the relation of physical and mental disabilities to criminality; and in the economic and moral advancement which is fundamentally associated with sound body and mind. The organization of preventive measures and health education in its personal application should be as universal as public education. Its support is a proper burden upon the taxpayer. It cannot be organized with success, either in its sanitary or educational phases, except under public authority. It should be based upon local and state responsibility, but I consider that the Federal Government has an obligation of contribution to the establishment of such agencies.

In July, 1929, a White House Conference on Child Health and Protection assembled at President Hoover's request "to study the present status of the health and well-being of the children of the United States, to report what is being done, to recommend what ought to be done and how to do it." Members of this Association have worked earnestly as members of the White House Conference. Dr William F. Snow of President Hoover's planning committee will outline the work during this meeting. In November a report will be made to the public. It will be followed by action for child health and protection. This Association will do its part.

Members of this Association are working on that important project known as a Study of the Costs of Medical Care, which concerns the people even more than the doctors, nurses and institutions engaged in the care of the sick. The facts already gathered indicate that changes of importance in the relation of medical service and the public health are imminent. The programs of the Rosenwald Fund, the Duke Foundation, and the Commonwealth Fund as they relate to community hospitals and to medical services may do much to influence these changes.

A most significant event of a different character but of world wide influence was the ceremony in Memorial Continental Hall, Washington, April 8, 1930, at the observance of the 80th birthday of Dr. William Henry Welch. Scientific gatherings throughout the world heard the President of the United States over the radio refer to Dr. Welch as "our greatest statesman in the field of public health," adding that "in organizing and directing research and application of medical knowledge on a wider field of prevention of diseases, he is among the preëminent few who deserve the title of statesman."

The passage in 1930 without opposition in Congress of certain acts

which this Association had advocated renewed our courage and faith in the future of public health work. The Honorable James S. Parker, Chairman, Committee on Interstate and Foreign Commerce, sponsored a bill that

> . . . aims better to coördinate the public health activities of the government, especially of the Public Health Service; to give more specific statutory authority for certain activities of the Public Health Service and, to a limited extent, to broaden others; to improve its administrative procedure; to change the name, increase the personnel, and enlarge the functions of the Hygienic Laboratory Board and to authorize the establishment of new divisions in the Hygienic Laboratory; to increase the pay of officers of the Public Health Service; and to place the dental, sanitary engineer, and certain pharmacist personnel of the service upon the same commissioned basis as the medical officers.

Senator Joseph E. Ransdell, of Louisiana, was the author of legislation entitled—

> An act to establish and operate a National Institute of Health, to create a system of fellowships in said institute, and to authorize the government to accept donations for use in ascertaining the cause, prevention and cure of disease affecting human beings and for other purposes.

Dr. George W. McCoy, who has so ably directed the Hygienic Laboratory, now becomes the director of the National Institute of Health. The Secretary of the Treasury has accepted from the Chemical Foundation, Inc., under the provision of the Ransdell Act a gift of $100,000 for basic chemical research. Bona fide health authorities of states, counties and cities find the facilities of the National Institute of Health available for their study and instruction. Fellowships are provided for, either at the Institute itself or at other research institutes both in America and abroad. The Institute will be housed in a new building with adequate equipment.

Several federal departments publish reports and bulletins of great value to public health workers. The *Weekly Public Health Reports* give the latest information on prevalence of disease and contain special articles by the highest authorities on medical and sanitary science. The phrase which precedes, " Prevalence of Disease," is quoted daily—" No Health Department, state or local, can effectively prevent or control disease without knowledge of when, where and under what conditions cases are occurring." To this simple sentence Dr. John W. Trask, of the U. S. Public Health Service, boiled down his excellent article " Public Health Administration, Its Dependence upon Reports of Sickness." The bulletins of the Hygienic Laboratory are studied and treasured for reference. We thank the U. S. Public Health Service for the wide and free circulation of its publications.

The publications of the Army and Navy Medical departments are not so widely circulated. Public health workers who do not receive them are missing very valuable material. I refer to *The United States Naval Medical Bulletin* and to the special bulletins issued by the Army. Recently, *Army Medical Bulletin No. 23,* an excellent text-book on Military Preventive Medicine, was published under the direction of Major General Ireland, Surgeon General. The author, Major George C. Dunham of the Medical Field Service School, Carlisle Barracks, Pa., is well known in this Association.

There is a service of greatest importance of which I wish to speak. Unhampered by governmental restrictions, without a trace of selfish motive, with no desire for publicity, and firm in disapproval of propaganda, the International Health Division of the Rockefeller Foundation carries on a most effective world-wide campaign for the advancement of public health.

In the annual report of the Rockefeller Foundation for 1929 it is noted that the expenditures for all activities of the International Health Division, July 1, 1913, to December 31, 1929, amounted to $39,815,421.50. Nearly $3,000,000 was spent to aid Local Health Departments; over a million for State Health Services; $1,200,000 for Field Service Expense, not pro-rated to Specific Budgets; $2,737,000 for Public Health Education; more than $800,000 for the Health Organization of the League of Nations; and nearly $15,000,000 for the Investigation and Control of Specific Diseases.

Dr. Frederick F. Russell and his associates, Dr. John E. Ferrell, Dr. Victor G. Heiser, Dr. Hector H. Howard and Dr. Wilbur A. Sawyer, direct the work of the International Health Division. Members of its staff are scattered over the world, and wherever an emergency exists or there is an opportunity for field study and scientific research which may result in benefit to the public health, reduce sickness or save lives, the International Health Division will be found quietly carrying on its work. Many members of its staff have lost their lives in such endeavor. On June 30, 1929, a young scientist of great promise lost his life in the investigation of yellow fever. The members of this Association while glorying in the achievements of men of this character have the deepest sympathy for the members of his family and most sincerely regret his death. I refer to Dr. Theodore B. Hayne of Columbia, S. C., the son of Dr. James A. Hayne, State Health Officer.

You are well acquainted with what the International Health Division does and with its representatives in laboratory, office, and field work. Its splendid coöperation with governmental agencies—

national, state, provincial and local—is always most satisfactory. This is due to the policy of the Foundation which from its beginning has limited its health work to direct relations with governmental authorities—national, state or provincial and local. While campaigns have been directed against hookworm disease, malaria and yellow fever, the real purpose has been to use these control measures to build up official health organizations. The most notable example in the United States of the success of this policy is the continuance of the full-time health organizations established during the Mississippi flood of 1927. Eighty-five of the 100 counties where full-time units were established during the emergency have placed them on a permanent basis.

The Foundation in refusing to furnish aid to private health societies has no thought of questioning the value of these agencies. It has simply chosen a line of effort which seems to present permanent results in strengthening the official departments which have responsibility for protecting and promoting the public health.

The southern states have good reason to appreciate the aid of the International Health Board, and its predecessor, the Rockefeller Sanitary Commission, and also the coördinated activities of the U. S. Public Health Service.

Dr. George E. Vincent retired from the presidency of the Rockefeller Foundation December 31, 1929, and was succeeded by Dr. Max Mason. It would be appropriate for this Association to express its appreciation of the distinguished services of Dr. Vincent in the field of public health and to send its cordial greetings to Dr. Mason, whose scientific career indicates his high qualifications for this most responsible position of President of the Rockefeller Foundation.

At the present time there are at least three problems which require the fullest coöperation for their solution. An honored member of this Association, Dr. William Royal Stokes, lost his life, and a number of other research workers' lives were jeopardized through their work during the outbreak of psittacosis. Many official reports on the outbreaks in the United States and Canada have been published. Still the problem is not solved. The outbreak of typhus fever in 1930 presents some interesting and unsolved problems. Malaria has shown undue prevalence in certain northern states and invites careful epidemiological study. Rocky Mountain spotted fever is spreading. Two wood ticks that infest man and are able to carry spotted fever, *Dermacentor variabilis* and *Dermacentor occidentalis,* overlap the territory infested with *Dermacentor andersoni,* and the possibilities of spread through the agency of these ticks seem considerable.

Dr. William C. Hassler, President of the Western Branch of the American Public Health Association, and Dr. W. P. Shepard, Secretary, arranged a symposium on spotted fever for the meeting at Salt Lake City last June. An exhibit by Dr. R. R. Parker, of the U. S. Public Health Service, stationed at the research laboratory at Hamilton, Mont., attracted wide attention. Another exhibit by Dr. R. R. Spencer received the gold medal award at the Detroit meeting of the American Medical Association.

The present situation may be stated as follows: thirteen states are affected. Those most seriously involved are Idaho, Wyoming, Montana and Oregon, but the disease is endemic in California, Nevada, Utah, Colorado and Washington. It has spread into New Mexico, North Dakota, South Dakota and Nebraska. Epidemiological evidence indicates that in some of the recent cases in territory where *Dermacentor andersoni* is not found the disease has been transmitted by *Dermacentor variabilis*.

The Hamilton, Mont., laboratory during the past year has received 587 requests for spotted fever vaccine for use in Canada, California, Colorado, Idaho, Minnesota, Montana, Nevada, New Mexico, Oregon, South Dakota, Utah, Washington, and Wyoming.

The western states invaded have requested the Surgeon General of the U. S. Public Health Service to assume full control of spotted fever work by taking over the Hamilton laboratory, erected by the State of Montana, and extending the scope of the work as he may deem necessary. It is desired that spotted fever research, including tick parasite work, but not including control work such as rodent destruction, dipping of domestic animals and quarantine, should become the responsibility of the Service, while control work will be continued under the state authorities.

The Montana State Board of Entomology (Dr. W. F. Cogswell, Dr. W. J. Butler and Prof. R. A. Cooley), organized 18 years ago, has worked continuously on Rocky Mountain spotted fever and is now of the opinion that the use of parasites to destroy ticks is the most practical and most promising line of control work. This Board is already at work with the French tick parasite (*Ixodiphagus caucurtei*), but other parasites wherever they may occur should be found and imported. If one parasite is good, more would be better, and it is far from wise to rely on one alone. Prof. Cooley conducted research in Africa in 1928. He found two tick parasites new to science but the federal government would not permit him to bring them into the United States until their habits could be thoroughly studied in Africa. Effort is now being made to secure a fund to send Prof. Cooley back to

Africa to search for new tick parasites, study their habits, and prepare them for shipment to America, and particularly to study the two parasites discovered in 1928.

Successful research of this character would solve problems that puzzle epidemiologists and enable public health administrators to employ means for control and eradication of diseases affecting animals and man which now cause suffering, loss of life and great economic waste.

The ultimate success in world-wide control of preventable diseases and of the effort to improve the health of the people will be measured by the efficiency of local health units. Governmental cooperation and scientific research will become most effective when utilized in every community by trained public health personnel. To the promotion of coöperation and of research and to the organization of efficient local health units in every community the American Public Health Association has pledged itself.

A Summary of the Records of Sixty-five Cases of Recoveries from Leprosy

A REPORT recently issued by the U. S. Public Health Service gives an interesting summary of the value of medical treatment for leprosy at the National Leprosarium which is conducted by the Service at Carville, La. More than 300 lepers, men, women and children, are under treatment there.

During the past 10 years, 65 lepers have been discharged from this hospital as apparently recovered from leprosy and no longer a menace to the public health. The average period of hospital care varied from 5 to 9 years. The shortest period of treatment was 1½ years and the longest was 17 years. Fifty-five of these patients received crude chaulmoogra oil by mouth, and 16 of this group received no other medicine. Twelve received benzocaine-chaulmoogra oil by intramuscular injection, and 4 of these received no other medical treatment. Twenty-one received the ethyl esters of chaulmoogra oil by intramuscular injection, and 8 of these received no other medicine.

The basic treatment of leprosy is similar to that for tuberculosis, and all lepers at the National Leprosarium, no matter what medicines are given, follow a sanatorium regimen of food, fresh air and rest, almost identical with that prevailing in a tuberculosis hospital.

The Precise Evaluation of Light Therapy in Experimental Rickets*

JOHN W. M. BUNKER, PH. D., AND ROBERT S. HARRIS, S. B.

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THE use of ultra-violet light in prevention and cure of rickets is well known. The ultra-violet which is commonly believed to be beneficial is between line 2,800 and line 3,100 Å. As far back as 1923 Hess and Weinstock[1] came to the conclusion that antirachitic radiations are limited to the zone 2,960–3,020. Others since that time have reported limits varying from these in some degree, but in the main it is today generally accepted that the antirachitic radiations are in the neighborhood of 3,000 Å.

The majority of the experimental data upon which are founded conclusions which have set these limits to the so-called "vital rays" have used as light sources mercury vapor arc lamps in quartz glass. The method in general was to employ filters of different selective absorption values which cut off short wave light up to a certain wave length, and in fewer cases cut off the visible end of the spectrum. One investigation by Sonne and Reckling[2] in 1927 made use of a quartz prism monochromator instead of filters. By this means it was possible to separate the lines of ultra-violet and to irradiate limited areas of white rat bodies with monochromatic ultra-violet light of different wave lengths between 2,200 and 3,560 Å. This would be an ideal way in which to investigate the problem of specific therapy from differing wave lengths if the volume and intensity of the illumination were sufficiently great. The size and cost of equipment to furnish a proper integration of ultra-violet light of sufficient intensity and dispersion completely to irradiate experimental animals is such that to date no such apparatus has been built.

A consideration of the various results obtained from the use of light filters may raise some doubt as to the validity of the general assumption that the therapeutic zone of light in successful treatment of

* Read before a Joint Session of the Food, Drugs and Nutrition and the Child Hygiene Sections of the American Public Health Association, at the Fifty-ninth Annual Meeting at Fort Worth, Texas, October 27, 1930.

rickets lies solely within the limits generally accepted. The principal reason for this doubt is the fact that experiments generally seem to have been planned without due regard for the fact that a "dose" of radiation energy is composed of two factors, intensity and duration. This makes necessary, for any valid comparison of different zones of light, not merely an equal time of exposure to different light bands but also the equalization of intensities of corresponding lines within the bands selected. It is admitted that occasional mention of energy measurement appears in the literature, but it is probably equally admissible that more exact work is required to support convincingly or combat the general conclusions which have been drawn. It is perhaps significant that the work, which from its published report seems to have included the most adequate precautions for securing a constant product of time and intensity, that of Sonne and Rekling, sets limits for antirachitic activity decidedly wider than the generally accepted limits.

In respect to visible light there seems to be no challenge of the theory that it is not effective in rickets therapy.

Attention has turned naturally to the question of the effect of infra-red radiations in rickets therapy since all ordinary sources of ultra-violet are at the same time sources of visible and of infra-red radiations. Hess and coworkers[3] reported in 1922 their finding that infra-red radiations interfere with antirachitic effect of ultra-violet, a conclusion which seems to have been corroborated by Clausen[4] in 1929. Reference will be made later to this point in respect to results obtained by the authors.

From the point of view of physics, it is recognized that light from any source is made up of lines differing from each other in frequency of vibration. Any photo-chemical effect is a function of frequency, intensity, and duration of exposure, since all these factors condition the input of energy by light. It is equally well established that the different lines of light from a quartz mercury arc vary greatly in individual intensities. It should be obvious that to compare the effect of a band of light containing lines of weak intensity with another band including corresponding lines of strong intensity, for the same length of time, may lead to erroneous conclusions as to the relative potency of the two bands in question.

For the above reasons, it was felt that there is needed an evaluation of different bands of light from the mercury arc lamp based upon comparisons wherein the intensity of light energy supplied should be equal in each case. Only from such a comparison can there be obtained a precise evaluation of light therapy in rickets.

In the attempt to secure such data at the Massachusetts Institute of Technology there were called in as collaborators Dr. Donald K. Stockbarger, radiations expert of the Department of Physics, and Dr. Edwin Wyman of the Children's Hospital in Boston, a recognized expert in successful application of radiations to rickets in children.

From the experiences of the authors in entering upon this, to them, new field of investigation there have arisen certain difficulties which it is felt may fall to the lot of any investigator in this field. From these experiences have arisen the suggested precautions which are offered in this paper for the benefit of others who are engaged in an attempt to execute precise experiments in this field of biophysics.

In the beginning of our work over 100 rats were carried through a period of 100 days in procedures gleaned from a study of the literature, before a single case of recognized rickets developed. The subsequent 700 or so animals used to date have behaved more satisfactorily.

We have come to the conclusion that it is possible to follow meticulously a classical method for developing rickets, and yet entirely miss the incidence of the disease. To prevent such disappointment we have outlined the following procedures which in our hands yield uniformly successful results.

The animals preferred are of Wistar stock, selected after comparison with stocks from other sources. The animals are bred in our own laboratory, using a diet for the mothers which is rather low in antirachitic factors, in so far as we know them, yet one which does not induce recognizable rickets in the parent or offspring. This diet was recommended by the Drug Manufacturers Association[8] in 1930. It consists of—

	Per cent
Ground entire corn, yellow	34.0
Ground entire wheat	33.0
Klim whole milk powder	21.0
Old process linseed oil meal	7.0
Green alfalfa leaf flour	4.0
Calcium carbonate	0.5
Sodium chloride	0.5

As we shall report in detail elsewhere, it is important to grind the corn into meal and then store it at ordinary temperature, covered from dust, for 6 months before using. Market corn meal is apt to be deficient in growth factors. Some samples of whole corn contain so much antirachitic principle that freshly ground meal transmits too much of it for subsequent methodical onset of rickets. We have not found it necessary to sterilize the ingredients, and have felt that to do so impairs the necessary vitamin content of the diet.

For water supply, the drinking bottles have been filled with tap water and distilled water in comparison, and no difference in Cambridge, Mass., is noticeable. The addition of a trace of iodine to keep down algal growths in the bottles has not been demonstrated to have any effect, although the recent report of Kay *et al.*[7] on the relation of thyroid activity and rickets should be kept in mind. All litters are reduced to six on the second day, and the animals are used for experimentation at age of 30 days, of weight 48 to 55 gm.

The rachitic diet of Steenbock No. 2965[8] has proved satisfactory since we standardized our ground corn to an age of at least 6 months. Previous to such procedure, when using fresh corn purchased from a large variety of sources, results were irregular and failure to develop rickets was the rule rather than the desired result.

Animals are kept on this diet for 24 days, being subjected to daily irradiation 7 days a week, and are then subjected to post-mortem findings by X-ray and the line test as modified and described below.

The preparation of light sources for irradiation is time consuming and requires the services of the radiation measurements physical laboratory. Filters have been employed for lack of the huge quartz monochromator which would of course be the ideal instrument.

A characteristic of light filters, not realized by some, is that they do not cut off sharply in their absorption. It is also unfortunate that two filter mediums which differ in the point of practical cut-off vary also in the relative intensity transmission of lines to which each is transparent. It is possible to say of any filter that it cuts off transmission of all radiations below a certain wave length, but it is equally true and unfortunate that the change from transmission to absorption is a sloping curve and not an abrupt line. We have found no common filters having a narrowly restricted zone of transmission in terms of wave length of sufficient relative transmission to be practical.

In our work, filters have been prepared of special glass and glass plus chemical solutions which cut off lines of shorter wave length than 2,650, and also successively increasing increments from the infra-red end of the spectrum. Since for each filter the relative transmission of lines common to all is variable, they have been standardized in sets to a common intensity at first one line and then another in the zone around 3,000. This has meant that through each filter the total energy has varied, but the energy at a particular line has been common to a whole set. Usually four filters have been used in this way at one time.

For a light source, Cooper Hewitt mercury vapor lamps have been employed each in a set-up standardized as to voltage, and at such a

distance from the animal bench that each delivers the same total energy from the bare arc. Each lamp was run for 100 hours to give the quartz the necessary preliminary aging. Each lamp is operated for the same length of time each day and all are frequently checked for uniform energy transmission.

A standardized dosage with the complete arc has been worked out which every time protects each of the eight control rats of an experiment against rickets.

Our diagnosis of rickets under these standard conditions is always by X-ray and line test on the femur bones of animals killed after 24 days. Macroscopic evidence of rickets has not been reliable in our experience. The line test is carried out in the classical manner with the exception that the split bones are held over night in the icebox in 10 per cent formalin and then after washing and the usual treatment with acetone and silver nitrate are exposed to ultra-violet light instead of the light of "a strong incandescent lamp." More positive demarcation of "lines" results.

In the X-ray pictures of the same bones, taken previously, a low voltage with slow development has resulted in formation of sharper shadows, more convincing to the examiner.

As the result of two years of continuous work, using upwards of 800 animals and employing the above precautions, but one repeatedly consistent result has been obtained. All animals subjected to the standard irradiation of measured intensity under the bare arc have been protected against rickets. In every other group excluding first infra-red, then visible light, then portions of the spectrum down as far as 3,300, with intensities equal at lines 3,000, or at 2,804, there has been some protection and some failure in protection. Single experiments can be selected from the list to prove that the vital band is restricted to a narrow zone and others to show equally convincingly that the therapeutic zone is wider. The unreliability of these experiments was demonstrated only by repeated checks and repetitions. Usually four repetitions of a given experiment were sufficient to show irregularities in results. Whether check experiments were carried out simultaneously on a given batch of animals or whether they were run successively under standardized conditions with the same identical set-up, the variations have occurred; yet all the while the control experiments with the bare arcs have been monotonously successful in protecting the animals, the intensity of the bare arc in the region of the so-called "vital band" always being equalized to the intensity of the same region of the filtered light.

In respect to the infra-red effects, our findings must be considered

tentative until several more repetitions of this work have been carried through. At present it appears that, whereas the bare arc unfiltered gives uniform protection, the same dosage if immediately followed by a certain amount of additional infra-red radiation lends protection in only about one-third of the animals. If, on the other hand, the infra-red treatment precedes the therapeutic dose of light from the bare arc, the protection is extended to two-thirds of the animals. Infra-red alone confers no protection. Moreover, in the case of a light filter which cuts off the short-wave middle ultra-violet but transmits in the zone of 3,000 with equal intensity to bare arc exposure, and transmits the remainder of the spectrum with varying intensities, there was at best 23 per cent protection if infra-red was a component of the total energy, but 40 per cent protection if the infra-red was removed by water. This appears to confirm and to amplify the findings of Hess and of Clausen.

CONCLUSIONS

In precise evaluation of light therapy in experimental rickets it is necessary to exercise meticulous care in standardizing all procedures in respect to breeding and care of animals.

In the matter of diet, one factor which may be variable to a bothersome degree is the amount of antirachitic factor in freshly ground yellow corn, which variable can be reduced by definite aging of the corn meal before use.

In comparison of different light zones, the characteristics and limitations of selectively absorbing filters must be understood, and compensations therefor be introduced into the set-up.

Numerous repetitions of each set of experiments, with controls common to all compared conditions, must be carried out.

In the light of results obtained, it is felt that the rather general belief that antirachitic effect of light in rickets prevention in white rats is confined to the zone of ultra-violet in the neighborhood of 3,000 Å. and that other parts of the spectrum from the mercury arc lamp are without contributory effect, is a belief that is not adequately supported by experimental evidence.

It is, in our opinion, still a possibility that the future will show that radiations longer or shorter in wave length than those of the alleged "vital band" of ultra-violet may assist in the biochemical processes of rickets therapy.

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Evolving a Health Department

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THE best way to secure a profitable discussion of health work as a governmental function is to take the actual experience of a health department, describing its problems and its phases of evolution.

Although Hippocrates warns us, "Experience is fallacious," I sympathize with Patrick Henry who said that he had "no other guide"; and I might add another maxim: "By knowledge is a house builded and by wisdom is it established."

In 1908, the General Assembly of Virginia, with the cordial approval of the governor, reorganized the State Board of Health and actually created a health department for the state. Prior to that year, health measures were limited to activity in the presence of large epidemics, chiefly smallpox, and the issuance of occasional literature.

Preventive medicine is probably still in its infancy; but it has made remarkable progress in popular esteem during the last quarter of a century, and much has been added to its strength. The vastly increased state and federal appropriations of today are a tribute to the intelligence of the people who are in annually increasing numbers becoming convinced that many of our diseases can be and should be prevented.

It may serve to show how intelligently our legislators viewed health work if I give the authorized personnel of the new department created in 1908. It was to consist of a commissioner, an assistant commissioner and a bacteriologist; but there was no doubt as to the intent of the law makers. They wished to insure the utilization of the knowledge then available, and they prescribed that the commissioner "be versed in bacteriology and sanitary science," that the assistant commissioner have similar qualifications, and that the bacteriologist be "competent." To carry out the provisions of the new law, and to make the work effective, an appropriation of $40,000 annually was provided.

Then came the duty of formulating plans and policies for the profitable expenditure of the appropriation. The new commissioner had no "lamp of experience"; so he sought to study by the lamps of others. He visited a number of other state health departments—

there were not many of them at that time—but he found no standards. He returned to Virginia feeling sure the work was in a pioneer stage and that the wisest course would be to begin by adapting to the chief needs of his state such knowledge as was available.

Even this elementary conclusion had its qualifications. A point at once to be established was—the field of the health department. Obviously it should not engage in curative medicine for that was an individual, rather than a public, concern; but there were other fields less clearly marked. The state was then, as it is now, recognizing as a public duty certain medical activities, such as the support of medical colleges, the licensing of medical practitioners, the free treatment of certain indigent patients at state supported hospitals, the maintaining of hospitals for the insane and schools for the deaf and blind.

We decided that none of these activities should properly fall within the purview of public health endeavor, even though some of them might have a distinctly public viewpoint; but there were some other activities discussed later that could not be so rigidly excluded.

Our first principle was: It is the duty of the health department to work for the benefit of the general population rather than for the benefit of any individual.

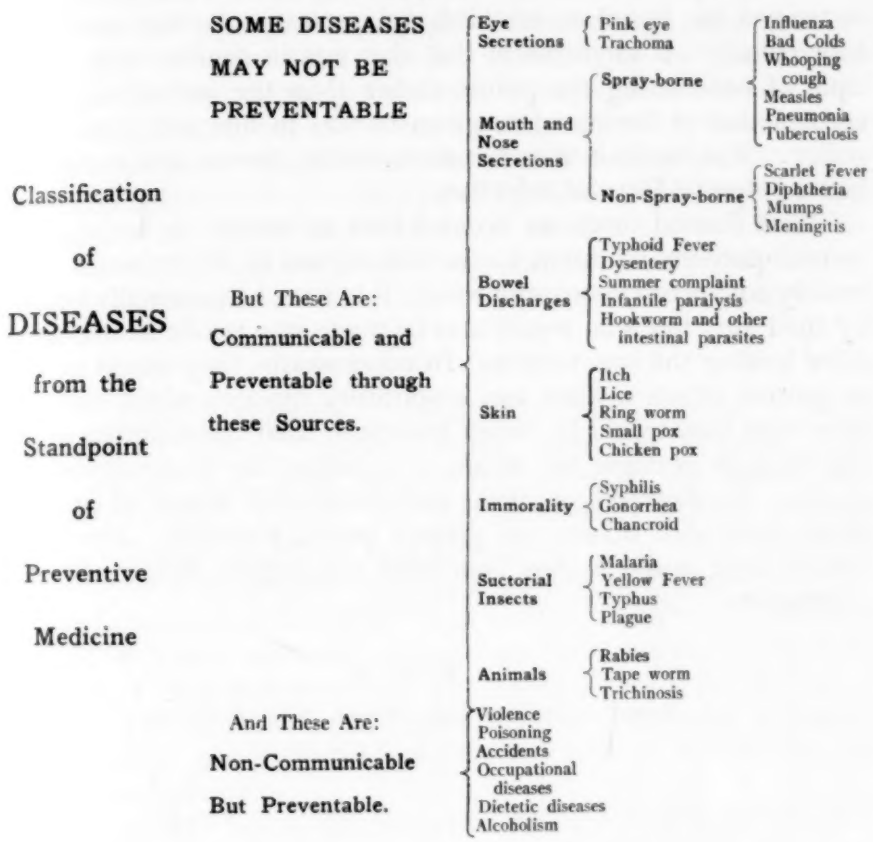
At once this marked the public health field as separate and distinct from the domain of the private practitioner, whose first duty is to his patient; but later we found that it was far easier to make such a distinction than it was to adhere to it rigidly. We found that we would have to modify our first principle, and whether we have been wise or unwise will be left for discussion.

We classified our chief undertakings as Education, Epidemiology and Laboratory. We sought to instruct the people, to tell them in simple language how single diseases and groups of diseases are transmitted and how the spread of such diseases might be prevented. A chart we used effectively to explain how diseases are transmitted is shown in Figure I.

As a logical complement of education and epidemiology in the pioneer stage, a laboratory is an obvious necessity. It enlists the interest of the practitioner, encourages him to do scientific work, and aids the department in securing prompt reports of communicable diseases. In that workshop, we have adhered to our first principle, we have limited our examinations to specimens for the diagnosis of communicable diseases, and do not examine for non-communicable diseases. Examinations of water samples to determine safety for drinking purposes are made.

Under our law, the Agricultural Department has supervision of

FIGURE I



milk and other foods. We have made only one departure from this principle made necessary by a development discussed later.

Our great handicap at the beginning was that we did not know where diseases were occurring. We had no bureau of vital statistics to give us information as to deaths; we had no reports of cases from doctors. Promptly we organized a system of monthly reporting by sending to each doctor in the state every month a letter in which we called attention to the law requiring monthly reports, and enclosed a return postal card on which were printed the names of the communicable diseases we wished reported.

In this way, we ascertained for the first time the relative prevalence of communicable diseases in the state. These reports were from the first valuable because we could locate epidemics, and make epidemiological studies that decided our original line of chief endeavor.

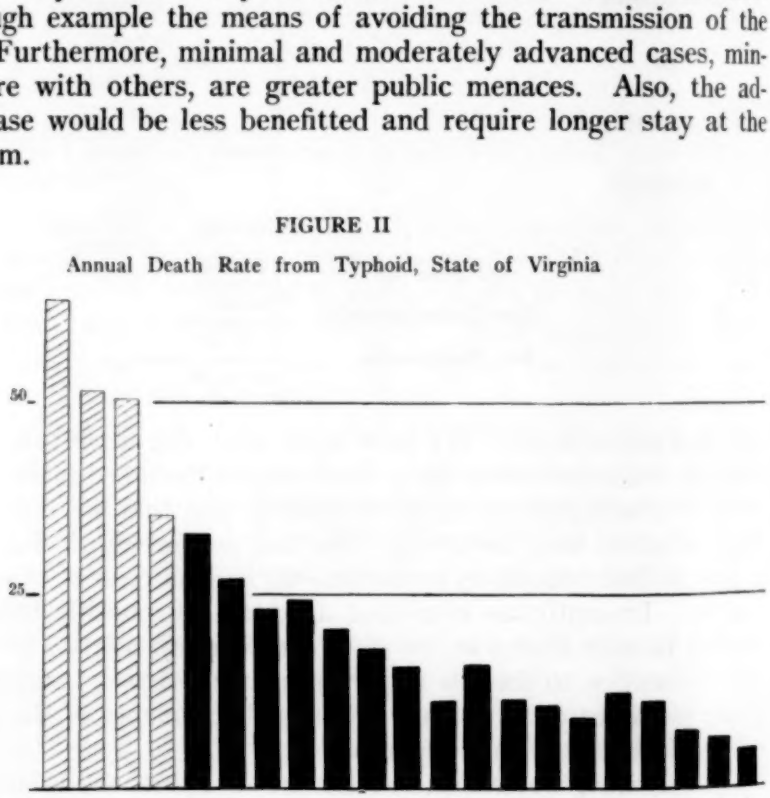
No special study or reports were needed to show that tuberculosis

was a major problem; and the law creating the new health department instructed the board to establish a sanatorium for the treatment of tuberculosis. It might seem that this was in conflict with our principle of considering the public rather than the individual; but our construction of the mandate given us was in line with public health policy. Tuberculosis was a communicable disease and every victim was a potential focus of infection.

With limited funds we decided that we would, so far as possible, restrict patients admitted to the sanatorium to the minimal or moderately advanced classes who would, it is true, be personally benefitted by their stay but who would also be made into public health agencies after leaving the sanatorium. In other words, they would be taught to protect others against any respiratory diseases which they might have, and they would be object lessons to their communities in teaching through example the means of avoiding the transmission of the germs. Furthermore, minimal and moderately advanced cases, mingling more with others, are greater public menaces. Also, the advanced case would be less benefitted and require longer stay at the sanatorium.

FIGURE II

Annual Death Rate from Typhoid, State of Virginia



YEAR	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
NO. OF DEATHS	1292	1063	1053	749	709	586	514	550	465	402	357	260	379	270	253	209	302	267	175	154	121
RATE PER 100,000	63.3	51.6	50.5	35.6	33.3	27.3	23.4	24.8	20.8	18.0	15.6	11.2	16.1	11.4	10.5	8.6	12.0	10.6	6.9	6.0	4.6
ESTIMATED CASES	15120	12447	12328	8770	11155	7051	6554	7115	5786	4447	3930	2809	4034	3161	2226	1748	2501	2072	1822	1362	1184

Our first discovery was that the intestinal diseases, mainly typhoid, were responsible for an undue proportion of sickness in towns and cities—generally throughout the state but especially in the more thickly settled communities. Upon presentation of these facts, the next General Assembly authorized us to employ a sanitary engineer and to begin the systematic protection of municipal and all other water systems supplying the needs of as many as 25 people. This engineer was also charged with the promotion of public sewer systems. Thus began the Bureau of Sanitary Engineering and the state supervision of all public water supplies.

RURAL SANITATION

In 1912, The Rockefeller Foundation helped to finance a hookworm study in several southern states, including Virginia. Our monthly reports from rural doctors had revealed the widespread prevalence of typhoid fever. The hookworm study showed in many counties an average of 20 per cent infection. These facts suggested the desirability of an accurate sanitary survey of rural homes, of sufficient size to serve as a fair guide to general conditions. So we surveyed 12,000 homes scattered throughout the state and found that 36 per cent of them had no sewage disposal facilities of any sort, and only 0.3 per cent had sanitary sewage disposal. Surely this was sufficient explanation of our typhoid, diarrhea, dysentery, hookworm and other intestinal parasites.

We had already begun the protection of municipal water supplies and the establishment of more municipal sewer systems, and now turned our attention toward the creation of rural sanitation. We established a division of rural sanitation. All public water supplies and public sewer systems have been left under the direction of our sanitary engineering bureau, but private supplies and sewage disposal are under the division of rural sanitation.

SANITATION OFFICER PLAN

For encouraging localities to undertake systematic sanitation, we devised a plan in coöperation with the U. S. Public Health Service.

Any county that desires to employ a sanitation officer must appropriate $1,500 annually. To that sum we add $1,000 and furnish a well trained man to do the work. As his value increases and becomes evident, the counties usually add to their appropriations and, to a certain limit, we increase ours proportionately. This worker, who gets a salary varying from $1,500 as a minimum to $2,400 as a maximum, is not a medically trained man but a layman, carefully trained

to do two things—show the people how to construct privies in which sewage will not be accessible to flies or endanger the water supply, and how to protect the water supplies from the contamination of human filth. We find that this work becomes increasingly popular as the years pass; less urging is needed to induce counties to engage sanitation officers; and their work frequently leads to the adoption of a generalized health department.

CHILD HEALTH

In 1916, we were asked to survey a rural county to determine the condition of the children. We were rather surprised to discover the large proportion of those with troubles that interfered with their normal mental and physical growth. Before we had reached any conclusion as to methods for solving this problem, the nation was plunged into war. Then the draft boards revealed the alarmingly large number of unfit. We were almost as bad as England in that respect, and conditions in England caused Lloyd George to say that it was impossible to build a Class A Empire out of Class C citizens.

As a natural corollary to our survey and the disclosures of the draft board, we had to begin work for the correction of defects of childhood. This we have been able to do most effectively and without any conflict with the medical profession.

The General Assembly of 1918 passed a law which makes it a prerequisite for obtaining a permit to teach that the applicant must have successfully passed an examination on physical education and physical inspection of school children, on the control of communicable diseases and school hygiene. The course of study is prepared jointly by the Superintendent of Public Instruction and the State Health Commissioner, and is now taught in all teacher training schools and colleges throughout the state and by a correspondence course conducted by the Health Department.

It has been a great factor in promoting popular health education to have over 16,000 teachers scattered through the state, each with some definite knowledge in elementary health matters, each knowing the simple facts in relation to the cause and prevention of communicable disease, each being able to recognize simple physical defects or departures from normality. The inspection work demanded of the teacher is a process which can be undertaken by anyone of good intelligence, if slightly trained. We require only inspection that will determine over or under weight, faulty vision, poor hearing, teeth requiring attention, and such obvious defects of nose or throat as make a child a mouth-breather or victim of frequent colds. This constitutes our 5-point program.

In the work of inspection, the nurse may assist if requested; but her main function is to establish contacts and to secure, if possible, the correction of the defects found. When the parents can pay for corrections, it is usually an easy matter; but when evident poverty prevents, the problem becomes difficult. In such cases, there is usually coöperation between the local health authorities, school authorities, doctors, and the population. The State Health Department will not assume any responsibility for the conduct of curative clinics; but will permit its local representatives to assist in the conduct of such clinics as are operated with the approval of the local health authorities and medical profession and in accordance with the plans approved by the State Medical Society.

For a plan to secure the corrections of dental defects, we requested aid from the State Dental Society. It appointed a committee; and a former president of the society gave up his practice for 6 months during which time he made a careful study of the dental needs of the rural sections, visiting nearly every dentist in the state. He formulated a plan which was unanimously approved by the society, and for 10 years it has been in successful operation. We have a director of oral hygiene who supervises the work and who employs 14 or 15 dentists to look after school children and even younger ones. An extremely moderate charge is made to cover actual costs. The great majority of the children pay though some are unable. If there should be a deficit from the clinic, the state and the locality share equally in the loss.

Few dentists, if any, object to this procedure. They frankly admit that our school clinics are advantageous to them through increasing their adult practice; and furthermore feel that children who have been taught the necessity of care for the teeth are not apt to forget that lesson when they grow up.

It certainly would seem possible for the medical profession similarly to adopt, in coöperation with public health authorities, a program that would encourage medical attention for children and thereby build up a desire for life extension that would cover all ages.

MATERNITY AND INFANCY

This problem of child health and welfare was closely associated with another subject, the health and welfare of mothers and infants. In 1912, the General Assembly authorized a bureau of vital statistics, and from the start it was evident that our maternal and infant death rates were unduly high. It seemed to us that these might be lowered by the use of public health nurses, registered nurses who had graduated from accredited hospitals and who in addition had received spe-

cial training in public health work. So, to solve these problems, a bureau of public health nursing and child welfare was established in the health department.

It was evident that mothers needed instruction in the care of themselves and their infants. This could be given by the visiting public health nurse, but her usefulness is necessarily limited. A correspondence course for mothers was begun. We were fortunate in securing as director of this course the wife of a doctor—a mother, and a graduate nurse with public health experience. A course of 12 lessons was planned with the help and approval of members of a committee of the State Medical Society. The popularity of the course is attested by the fact that 2,589 have taken it in 7 years.

But how were we to function without interfering with the private practitioner? We did not want to depart from our principle of limiting our viewpoint to the public versus the individual notwithstanding the definite need for the service; so we asked the organized profession in Virginia, as represented by the Medical Society of Virginia, to appoint committees to coöperate with us in formulating plans and in conducting the work. Later the federal government adopted the Sheppard-Towner plan of aid to states engaging in work for mothers and infants.

Strictly speaking, this as a function of the public health department is debatable, however desirable and popular it may be. However, in states preponderantly rural, especially in those presenting topographical difficulties of intercommunication and economic stresses, the work is justifiable especially when it is so conducted as not to trench upon the legitimate domain of private medicine.

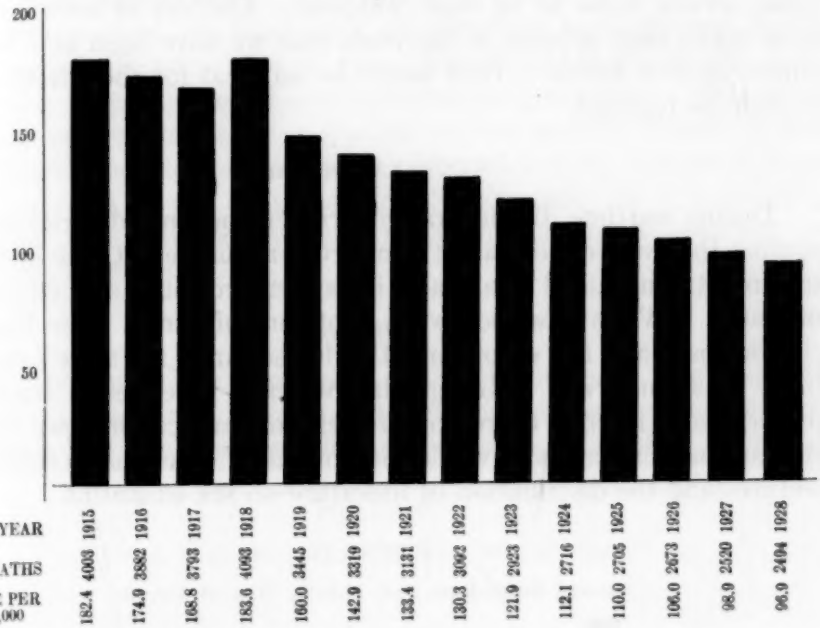
As part of the maternity work, we endeavor to exercise control over midwives. It is not so effective as we would wish, but it is becoming more so. When we began supervision and instruction of these women there were about 9,000 midwives in the state; there are now less than half that number practising. We have a state director of midwifery instruction, and she personally or through nurses has trained and given instruction to classes in 85 counties. Local midwives are required to attend those classes; and the ignorant ones soon drop out. We have not endeavored to fix standards for midwives. They constitute a problem which we do not feel entirely competent to solve. Our doctors admit the necessity for them while deploring their lack of training. We, therefore, have followed the advice of the profession and confined our eliminations to the glaringly unfit.

There is one laboratory operation which could not by itself be regarded as a public health endeavor, yet we have to undertake it as part of a program. Having adopted a plan for maternity work, we

have had to consider prenatal conditions, and do urinalyses when samples are sent by our nurses for midwife cases. This enables the nurses to assure medical care for those mothers who need it, and many who might have risked their lives with midwives have, by this method, been placed in time under the care of physicians.

FIGURE III

Annual Death Rate from Tuberculosis, All Forms, State of Virginia



TUBERCULOSIS CONTROL

I have mentioned the establishment of a tuberculosis sanatorium, during our first biennium. We now have 3 of these institutions, 2 for white people and 1 for colored. We have still further extended our work for the tuberculous. Years ago it became obvious that only a small proportion of the tuberculous in Virginia could be provided with sanatorium care, so we inaugurated a system of case finding clinics and out-patient service. Again we were assured sympathetic coöperation on the part of the medical profession.

We have two traveling clinics, each consisting of 1 doctor and 4 nurses. Each doctor spends 1 week in a county and each nurse spends 4 weeks. The nurses visit all doctors in the county, find contacts, advertise and arrange the clinics, assist the clinician while he is in the county, and after the clinic it is the job of the nurse to induce all positive or suspected cases to go to their family physicians. All local

doctors are invited to take part in the clinic. The findings of the clinician are reported to the family physician.

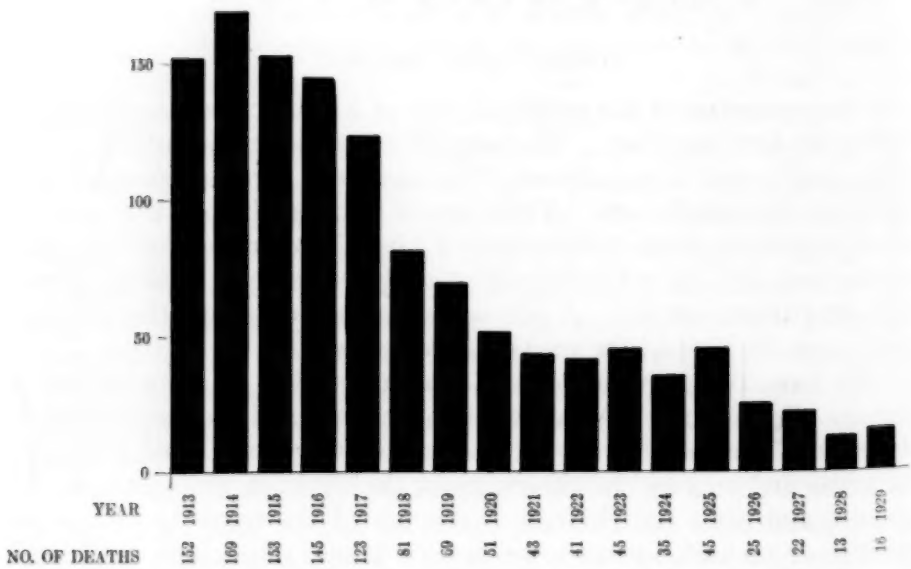
Although the Medical Society of Virginia approved our method of conducting case finding clinics, we never go into a community unless we have previously secured the approval of the local doctors. At first, some of these demurred, taking the ground that our clinics were a reflection on their skill in diagnosis; but, as patients not under a doctor's care began to visit the doctors, this opposition waned and the clinic service came to be most welcome. Doctors in some localities have taken such interest in the work that we have been able to leave clinics in their hands. That would be an ideal for the whole state if it could be realized.

VENEREAL DISEASE

During wartime, the federal government began a determined fight against the venereal diseases; conducted a number of free clinics for treatment; and aided financially in law enforcement and educational measures. When it withdrew its allotment of funds, these local free clinics closed and law enforcement ended so far as the state's responsibility was concerned. Recognizing venereal diseases as matters of public health interest by reason of their communicability, we felt that educational propaganda would be justified. This has consisted of lectures and the distribution of literature on sex education.

FIGURE IV

Annual Death Rate from Malaria, State of Virginia



Even in this limited field we were not entirely satisfied that we were justified; so we addressed letters to all college presidents in Virginia and to all division superintendents of schools asking for opinions as to the value of the work as conducted, and whether, if worth while, it should be continued under the Health Department or the Department of Education. So many answers indicated a preference for the Department of Education, and this so coincided with our views, that we asked the General Assembly of 1930 to reduce its appropriation to us to be used for this work.

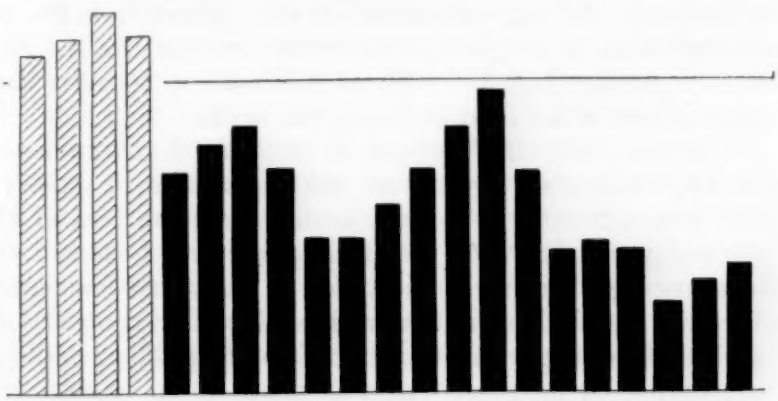
A large part of our laboratory examinations has, however, to do with venereal diseases. We do more than 30,000 Wassermanns each year and a large number of examinations for gonorrhea. This work probably requires no excuse as a public health activity, though at one time private laboratories did object. The subject was discussed at an annual meeting of the State Medical Society and, by a practically unanimous vote, the society requested us to continue this service to the doctors of the state.

MALARIA

We have naturally developed our epidemiological work as the years have passed and have undertaken some definite campaigns as a consequence. For instance, for several years we made a strenuous

FIGURE V

Annual Death Rate from Diphtheria, State of Virginia



YEAR	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
NO. OF DEATHS	431	466	519	484	302	340	374	316	221	216	279	334	399	463	337	216	238	228	150	180	211
RATE PER 100,000	21.1	22.6	24.4	23.0	14.2	15.8	17.1	14.2	9.9	9.7	12.1	14.4	17.0	19.5	14.1	8.9	9.6	9.1	5.9	7.0	8.1
ESTIMATED CASES	6175	6669	7428	6925	5146	5734	5346	6777	4059	2900	3965	4958	7760	8735	5249	3786	3639	4040	3420	3145	3646

campaign against malaria in sections which showed a continuing and large prevalence. Malaria has virtually disappeared as a cause of death. To what extent that has been due to our efforts or to influences unrecognized by us, I do not presume to say; but the reason for intensive and strenuous work having ceased, we are not now paying as much attention to malaria. We have many notable instances where a long standing and extensive prevalence of severe malaria disappeared under the strenuous, well directed anti-malaria measures conducted by the United States, state and local agencies.

DIPHTHERIA

Three years ago we immunized about 200,000 children; or, to be more exact, we gave toxin-antitoxin to that number. Our death rate from diphtheria made an immediate and most satisfactory decline in face of a higher rate that year for the nation as a whole. Since then we have more nearly approximated the national curve, which indicates a necessity for a second campaign.

OPPORTUNISTS

I mention these instances to show that we have been opportunists, doing the work which seemed most timely and necessary, dropping special campaigns when they seemed to have accomplished their purposes, returning to them if later it should seem necessary. We may again have to work intensively against malaria. Although our succeeding General Assemblies have been increasingly appreciative of health work, and our appropriations have grown from the modest first appropriation of $40,000 to somewhat over $1,250,000 for the biennium beginning July 1, 1930, we still have to consider carefully our expenditures in the light of immediate needs.

Virginia, following the lead of the federal government, placed in the Department of Agriculture the supervision of dairies and food. This arrangement was in force before the State Health Department was recognized in 1908. While in principle I believe a state health department should have supervision of dairy and food products as in cities, in practical operation we have had fine coöperation with the officials of this department and I believe the public health is efficiently safeguarded by the present arrangement.

In 1927, the sanitation of shellfish handling and production was placed with the health department. A floating laboratory is maintained for testing the pollution of growing beds, inspection is maintained of shucking plants and the personal hygiene of the workers. Furthermore, there is steady effort made to bring about sanitation in

the whole oyster producing area that all the filth-borne diseases will disappear.

CONCLUSION

I have given in bald outline the major steps in the development of health work in my state. In conclusion, I ask you to consider the activities of health work for which public funds are appropriated. These may be roughly divided into:

Prevention of disease
Promotion of health
Cure of disease

With the last we are not concerned. We are directly concerned with the first, and we have a considerable interest in the second, the responsibility for which we divide with the medical profession.

To illustrate our interest in the first division, we might define the subject as embracing health education; sanitation, which would include excreta disposal, protection of water supplies, the guarding of milk and foods, the control of flies, mosquitoes and other germ-carrying insects; personal prophylaxis, such as vaccination against smallpox, diphtheria, typhoid or any disease for which we may find a reasonably successful immunizing agent; epidemiological work for either study or control; laboratory; and vital statistics. Surely no one can dispute our interest in these subjects and our right to work in these fields.

Promotion of health I take to include maternity and infancy welfare, instruction and practice in physical inspection of school children, school hygiene and correctional clinics. I am not including in this list tuberculosis clinics as conducted by us—they are in effect helping in diagnosis of communicable disease—but I would include periodic examination of adults, not as something to be undertaken by us but as something to be encouraged by all health workers. So far as other divisions are concerned, I have told how they operate in Virginia; and they are open for discussion.

It seems to me that under the classification, "Promotion of Health," we find our twilight zone. Any effort in these lines may easily become obnoxious to the profession; and we cannot hope to gain in popularity, esteem or results, if we align the medical profession against us. All activities in this classification should be developed with the approval of the medical profession and carried on with the coöperation of the doctors. It is always well to consider the undeniable fact that, when we plan to enlarge our fields of usefulness,

we should be sure that, in striving for wider areas, we do not risk the area we occupy.

When developing full-time health service in rural sections, we recommend, as the first step, the employment of a sanitation officer, whose entire time shall be devoted to the securing of sanitation and to the protection of individual water supplies. Our second recommendation is the employment of a public health nurse, who serves principally in maternity instruction, in teaching infant care and looking after children in the schools. We do not recommend a full-time medical health officer until these lay workers have been assured, for unless he has these workers to aid him he is not apt to justify the cost of his employment; and, so we insist, that when a medical health officer is employed, he shall have these lay assistants.

Investigation of Infant Mortality in Brazil

A REPORT on the investigation of infant mortality in Brazil, made under the auspices of the Section of Hygiene of the League of Nations, was recently published.

The investigation was made in 8 districts, some urban, others rural, and was concerned with 7,379 live births, mostly in poor families. The infant mortality rate varied according to the district from 96 to 201 per 1,000 live births. The lowest rate, 96, was obtained in a prosperous town, where living conditions and sanitation were satisfactory; there was also in that town a health center maintained by the Government and doing prenatal and child welfare work, and a clinic for venereal diseases. The highest infant mortality rate was obtained in a rural district where the inhabitants were very poor, and the conditions of sanitation were very unsatisfactory.

More than one-half of the children studied died before the end of 3 months, and almost one-third of all deaths were caused by diseases due to nutritional disturbances. It was found that while 40 per cent of the children were fed at the breast, of those who died of nutritional disturbances only about 13 per cent were so fed.

It was also noted that the care given to the mothers at childbirth and to the child improved with the improvement of the economic situation of the family.—*Archivos de Hygiene,* Publicação do Departamento Nacional de Saude Publica, Rio de Janeiro, 1930, No. 2, p. 61.

Incidence of Partial Paralysis*

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IN March the attention of the Tennessee State Department of Public Health was called to the occurrence of a number of cases of a condition which, for want of a better term, has been called "partial paralysis." A number of other terms have also been applied such as "peripheral polyneuritis," "toxic polyneuritis," and "Jamaica ginger paralysis." Terms in common usage have been: "Jake leg," "Jake foot," "Jake hop," and "Jake paralysis."

So far as our information goes, cases have been reported in greater numbers in the southern states, especially Mississippi, Alabama, Georgia, Oklahoma, Tennessee and Kentucky.

The experience with regard to the cases occurring in Tennessee is the basis for this paper. There have been gathered more or less complete histories from 208 cases. This in all probability does not indicate the true extent of the condition, as many cases have occurred without being seen by any physician. Information gathered in the areas of greatest prevalence in Tennessee leads to the assumption that only about two-thirds of the cases have been reported. Of the 208 cases, 185 were from 4 counties, Washington, Carter, Sullivan and Unicoi, which are contiguous and located in the extreme northeastern section of the state, the greatest number being from the 2 counties first mentioned—Washington with 120 cases, and Carter with 52 cases. However, scattered cases were reported from 8 other counties.

SYMPTOMS

The first thing noted in the majority of cases was weakness of the feet. This was followed by soreness in the calves of the legs, and tenderness over the calf muscles on pressure. In a few instances a history of an antecedent acute infection was elicited, such as sore throat, coryza, or symptoms suggesting an infectious onset such as chill, fever, general body aching, and headache. This appears to have been coincidental. There occurred in some cases premonitory symptoms of soreness in or quivering of the calf muscles.

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* Read before the Epidemiology Section of the American Public Health Association, at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 29, 1930.

Paralysis of the lower extremities reached its maximum extent in from 2 days to 1 week. Those patients showing involvement of the fingers, hands or wrists, stated that these members did not develop weakness until from 3 days to 1 week after the time of onset of weakness in the feet.

When questioned, the patients complained of coldness of the affected extremities, and many complained of numbness and tingling. The latter symptoms were frequently transient, existing only for 24 to 48 hours. Only 1 complained of anesthesia over the feet. There were no cranial nerve symptoms in any patient, and no history of sphincter disturbance.

NEUROLOGICAL EXAMINATION

The following is quoted from reports of Dr. Hugh J. Morgan, Professor of Clinical Medicine, Vanderbilt University, opportunity having been afforded him to see and examine some 15 cases.

Gait—The gait is the typical steppage gait of peripheral neuritis with dragging toes and flail-like tapping of the feet. Patients use canes or crutches and constantly hold to some object, walking from wall to chair, to bed, etc.

Trophic Disturbances—The affected members are invariably cold and wet with perspiration. Cyanosis of the affected members was present in a few, and 1 girl showed slight edema of the affected feet. This same patient showed over the shins and feet a diffuse erythema with a few papular erythematous lesions interpreted as trophic. All complained that the affected members were cold, and this, together with the sweating, was the most striking vasomotor change.

Motor Changes—Complete or partial paralysis of the muscles of the flexors and extensors of the toes and feet were the most constant findings. Dorsal flexion of the toes and of the feet was constantly impaired. In some cases plantar flexion of the toes and feet was not completely absent, even though complete paralysis of the opposing muscles was present. Weakness in the flexor and extensor muscles of the leg was seen, but in fewer numbers, and no complete paralysis of these groups of muscles was noted. Two cases showed involvement of the thigh muscles.

In the upper extremities the first muscles affected seemed to be those of the thumb and first finger, although complete extensor paralysis of the fingers was common. Extensor paralysis or weakness of the wrists was also almost invariably present when the upper extremities showed any involvement at all. Patients were also seen who showed involvement of the fingers and wrists, although these were less numerous. About half of the patients showed some involvement of the upper extremities, whereas all of them showed lower extremity involvement.

Motor cranial nerve involvement, or involvement of the trunk muscles, was not observed in any patient.

Sensory Changes—Mild subjective sensory disturbances were complained of by many patients. Demonstrable sensory changes were noted in relatively few. Two patients were seen showing a stocking type of anesthesia over the lower extremities. One of the Vanderbilt Hospital cases has shown the glove type of anesthesia of the upper extremities.

Most of the patients complained of tenderness on pressure over the calf muscles. No definite tumefactions were felt along the course of any of the peripheral nerves.

Reflexes—Absent ankle jerks was a constant finding. Not a single case showing absent knee jerks or absence of the deep reflexes of the upper extremities was seen. The cremasterics and abdominal reflexes showed no constant change. In cases closely questioned there was no history of any disturbance of visceral reflexes (bladder, rectum).

Cranial Nerves—A complete examination of the cranial nerves (including ophthalmoscopic examination) was made in 9 cases with negative findings.

Clinical descriptions and reports of cases in other areas are to be found in publications by C. R. Bennett,[1] and S. Harris.[2]

TENNESSEE EXPERIENCE

The State Department of Public Health was first advised of the development of these cases on March 8, 1930. Staff members were immediately sent to assist the local full-time health officers in an investigation. Epidemiological case cards were completed for all cases that could be located. It was immediately apparent that a decidedly strange age and sex distribution had occurred when comparison was made with the conditions of a communicable nature. No case had occurred under the age of 15 years; 79 per cent of cases were in the age group 20 to 45 years. Of the total 85 per cent were males. Such a distribution could not be compared with any infectious condition with which previous experience had been had. Such a distribution might occur as a result of exposure of certain occupational groups to the causative agent.

Many types of occupation were represented, as follows: 67 were laborers of various kinds, 23 of these being in artificial silk manufacturing plants, this being the main industry of Elizabethton; 19 were clerks; 17 were classed as housewives; 14 were merchants; 11 were farmers; 10 were cooks; 8 were mechanics; 6 were carpenters; 2 were contractors; 2 were plumbers; 2 were brick masons; 2 were policemen; 2 were physicians, and 1 each was listed as: lawyer, salesman, painter, barber, cobbler, postmaster, optician, schoolboy and "bootlegger." With such a wide diversity of occupations it was readily apparent that there could be no explanation of the occurrence of the cases as a result of any occupation or occupational condition.

Thirty-three per cent of cases were classed as in poor, 62 per cent as in moderate, and only 5 per cent in good economic circumstances.

The occurrence of cases in various areas at the same time, and the peculiar distribution of sex and age excluded the possibility of the causative agent being contained in some common vehicle such as water, milk, ice cream, or some other food.

It was apparent that the causative agent became effective in adult age groups, and to a greater extent in males than in females, and involved a higher proportion of persons in moderate or poor economic circumstances. It was reasoned that this was due to greater exposure in these groups.

Inquiry was made as to the use of alcohol containing preparations. Only 4 persons (less than 2 per cent) denied the use of such preparations. Two of these were said by other persons to be known to use alcohol. It is evident that in certain cases admission of the use of alcohol would be difficult to obtain. Seventy-two per cent of those admitting the use of alcohol also gave a history of the use of fluid extract of Jamaica ginger. It is quite possible that others used Jamaica ginger without being aware of it, as it seems to have been the practice of some liquor dispensers to add this product, believing that a more potent compound was the result.

The fluid extract of Jamaica ginger used was not confined to the product of any one distributor, nor to one particular brand. According to labels and samples collected from various sources, Jamaica ginger of a variety of brands had been used. This product seems to have been readily available at smaller grocery and drug stores, was relatively less expensive than certain other alcohol containing preparations, leading to the term applied by some, " the poor man's drink," as it could be obtained in small quantities, and with consequently less outlay of funds. It was thought by some users that this product gave a quicker reaction with less after effects. The burning sensation to mucous membranes was overcome by dilution with water or soft drinks of various kinds. Some persons, however, stated that the material was used without dilution.

The history as to the time of last using alcohol was obtained in as many instances as possible. In the case of more or less constant users, this information was not of much value. From certain other individuals, it is evident that no great reliance could be placed on the information obtained, as the date could not be fixed with any degree of accuracy. However, 53 per cent of cases stated that the time of last using alcohol before appearance of paralysis was between 1 week and 1 month previously, 32 per cent stated it was less than 1 week, and 15 per cent that it had been more than 1 month.

There appeared to be no relation between the amount of the fluid extract of ginger consumed and the severity of symptoms. Apparently small amounts in some individuals produced the same result as very much larger amounts taken by others. It seems safe to assume that the paralysis did not occur in all persons exposed to the causative

agents. Apparently reliable histories were obtained in which it was noted that of several persons, members of the same party, and exposed in essentially the same manner and degree, some subsequently developed the paralysis and others did not.

The date of onset was obtained as accurately as possible. Seventy-two per cent of cases had an onset within the first 10 days of March, 21 per cent before, and 7 per cent after this period. All but 3 had an onset within a period of 30 days.

Taking into consideration all the data at hand, it seemed reasonable to assume that the cause of this condition was closely associated with the use of alcohol, and the evidence pointed very strongly toward the probability of one alcohol containing product, namely, fluid extract of Jamaica ginger, being the vehicle involved. It should be emphasized, however, that neither alcohol of itself nor the standard fluid extract of Jamaica ginger was considered as a causative agent, but rather that the sub-standard fluid extract acted as the vehicle by which the actual causative agent was enabled to enter the human mechanism.

FURTHER PROGRESS OF CASES

The further progress of these paralytic cases has been watched with a great deal of interest, by practicing physicians, public health officials, and the lay public. Opinions differ as to the prospect of complete recovery, and the progress made toward this hoped for outcome. An opportunity for the study of the pathology of the condition was afforded by necropsy following the death of one individual from intercurrent causes. This was reported by Dr. Hugh Jeter.[8] Briefly summarized, the results of the preliminary examination were the finding of a definite lesion of the peripheral nerves and no evidence of any such lesion of the cord or brain. This consisted of a perineural exudate composed largely of lymphocytes, many of which were large; a few scattered polymorphonuclear leukocytes; many red cells, and a slight amount of fibrin. This perineural exudate was stated to be most certainly an acute process limited to the peripheral nerves, and in patches along the nerves. No microörganisms could be demonstrated in the exudate, nor was there evidence of any acute chemical poisoning.

Some observers are of the opinion that definite but very slow improvement is being noted, while others believe that the seeming improvement is due to the education of other muscles to take over in part the functions of those whose nerve supply has been disturbed. Certainly the progress toward recovery is very slow. No complete recoveries have been reported, notwithstanding the fact that more than 6 months have elapsed since the development of the paralysis.

LABORATORY STUDIES

A plan of study from a laboratory standpoint was projected by the Tennessee Department of Public Health in coöperation with the Vanderbilt University School of Medicine. The results of this study will be available at a later date.

A preliminary report by Dr. Maurice I. Smith[4] and others from the National Institute of Health (Hygienic Laboratory) of the U. S. Public Health Service indicates through pharmacological and chemical studies that the cause of this unusual type of paralysis is probably a phosphoric acid ester of tricresol. Further experimental work is being carried out along these lines at this institution.

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National Association of Juvenile Courts

IN compliance with a resolution passed at the International Child Welfare Congress held in Paris in 1928 and calling for the organization of an International Association of Judges of Juvenile Courts with national organizations within each country, a royal decree issued by the King of Spain on May 16, 1930, provides for the organization of a National Association of Juvenile Courts in that country. Among the purposes of the organization the decree mentions the study of questions relating to the work of the juvenile courts, promotion of coöperation between these courts, work for the establishment of new juvenile courts, training of the staff of the juvenile courts and investigation of matters relating to the work of these courts.

Agglutination Tests for the Diagnosis of Undulant Fever*

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IT seems obvious that coöperative investigations by public health laboratories in a state should add interest to the work of the laboratories, increase the solidarity of their association, and yield results of general value. A statement of the ideal, however, does not remove the difficulties which lie in the path of such an undertaking. The selection of a topic of sufficient interest to all members of the association, the choice of work which lies within the capacities of the individual laboratories to perform, and the arrangements for a central office for the supply of materials and information and for the collection and handling of the reports of results, are important details to be arranged outside of any solution of the problem under investigation.

In order to find out whether the independent laboratories of the New York State Association of Public Health Laboratories could carry through a coöperative investigation and derive the expected benefit from the effort, it was decided by the association, in 1928, to embark upon a joint enterprise in 1929. The topic chosen for investigation was "Agglutination Tests for the Diagnosis of Undulant Fever." Although this topic was not original, it was timely.

The plan was to use for these tests specimens of human serum received at the laboratories for any sort of examination. It was thought that by making agglutination tests with these serums and a suspension of *Brucella abortus,* positive results would be obtained in cases in which undulant fever had not been suspected, as has been the experience elsewhere during the past few years in which many previously unrecognized cases of undulant fever have been uncovered by means of routine agglutination tests.

It was hoped that these tests would give some information as to the incidence of undulant fever in different parts of New York State and it was expected that tests with serum from patients suffering with

* Report of a Coöperative Investigation by Members of the New York State Association of Public Health Laboratories during 1929.

a great variety of diseases would throw additional light upon the specificity of the reaction.

The coöperative investigation was conducted according to the plan from January 1 to December 31, 1929. The following is a report of the methods used and of the outcome of the work.

As this report deals primarily with an enterprise of the New York State Association of Public Health Laboratories, a general review of the literature on undulant fever in this country has not been included in it. Extensive bibliographic reference to the important and well known work which has been done on this subject in the past few years was thought to be unnecessary here, as excellent reviews of this work are generally available.

METHOD

The offer of the Rochester Health Bureau Laboratories to serve as headquarters for this investigation was accepted and during the year all correspondence and supplies of materials were handled through the office of those laboratories. After consultation with the State Laboratory, a standard procedure was adopted for the agglutination tests. Letters were addressed to 57 approved laboratories throughout the state inviting them to take part in this investigation. Of these, 21 indicated a willingness to join in the enterprise. The number, however, was reduced by various circumstances to 17. Table I gives a list of the laboratories in which the work was carried out during the year. In these, 3,716 specimens of serum were tested for agglutinins for *Brucella abortus*. The location of the laboratories and the location of cases with positive agglutination reactions are shown on the accompanying map (Figure I). As will be seen from an inspection of the table and map, the coöperating laboratories were well scattered throughout New York State.

PROCEDURE

The antigen was supplied in 100 c.c. bottles. Agglutinating serum for repeated controls of the sensitivity of the antigen was supplied in 1 c.c. vials. These materials were sent out with the following description and rules for performing the tests:

Antigen—The antigen is a saline suspension of a culture of *Brucella abortus*, Strain No. C209, obtained from the New York State Laboratory at Albany. This strain was originally isolated from cow's milk. The organism was grown on glucose meat infusion agar pH 7.4, washed off with saline solution and killed by heat at 60° C. for 1 hour. The suspension was diluted with 0.85 per cent NaCl solution containing 0.1 per cent formalin to match in density a No. 3 barium sulphate stand-

ard. Before using the antigen, shake up the suspension thoroughly. Control agglutination tests with this antigen have been satisfactory.

Anti-abortus Serum—This vial contains 1 c.c. of diagnostic agglutinating serum for undulant fever. This serum is to be used as a control for the agglutinability of the antigen suspension of *Brucella abortus* in each day's series of tests.

This serum is now diluted with an equal amount of 50 per cent glycerin. For the control test use a final dilution of 1–400.

Add 1 c.c. of this glycerinated serum to 99 c.c. of salt solution containing 0.5 per cent of phenol. This gives a dilution of 1–200. Use 0.3 c.c. of this dilution in the control test.

This diluted serum should keep satisfactorily in the icebox for 6 months or longer.

Procedure—1. Use 0.3 c.c. amounts of serum diluted 1:5, 1:10, 1:20, 1:40, 1:80, 1:160. The final dilutions when equal amounts of culture suspension are added will be double these (e.g. 1:10 through 1:320). In case agglutination is obtained in the 1:320 dilution, test higher dilutions of the serum in order to determine the titer.

2. Use two control tubes, one containing 0.3 c.c. of saline plus 0.3 c.c. of antigen to make sure that the suspension remains homogeneous, and one containing 0.3 c.c. of a known agglutinating serum plus 0.3 c.c. of antigen. Check up the agglutinability of the suspension.

3. Use 0.3 c.c. of the antigen culture suspension in each tube.

4. Use tubes measuring 11 by 75 mm.

5. Fresh or inactivated serum may be used.

6. *Incubation*—Incubate the mixtures for 2 hours at 37° C. Record the reactions. Place the tubes in the icebox over night and record the results.

7. *Recording of reactions*—Read the tests in the morning and record the degree of agglutination as follows: 4 + = complete agglutination, supernatant fluid clear, all large clumps; 3 + = supernatant fluid clear or nearly clear, very definite clumping; 2 + = supernatant fluid not clear, definite clumping; + = supernatant fluid not clear, very small clumps definitely visible to the unaided eye; — = suspension uniformly turbid, no clumping.

All laboratories are requested to follow this procedure, which is based upon the *Standard Methods of the Division of Laboratories and Research of the New York State Department of Health.* If a different procedure is being followed in your laboratory, please do the test by both methods when possible and record the results of both tests for comparison.

Records—Printed cards with headings and spaces for notations are being sent to you. Please give all the information asked for on this card and add any additional appropriate information. It is requested that all records for the association be kept on these cards to secure uniformity and facilitate compilation. Cards may be returned periodically or at the end of the year.

Various comments were received on the antigen. Dr. Charles Carpenter found this suspension less agglutinable than the living cultures which he has used in his work. Undoubtedly it was not a highly sensitive antigen. Its sensitivity, however, was apparently sufficient to give good results in cases of undulant fever and probably reduced

the number of weak reactions without loss of diagnostic precision. Its keeping qualities were excellent, as it lost none of its sensitivity during a year. In the tests it served as well as a suspension of *Brucella melitensis* from true malta fever in man, which was used by the State Laboratory in a number of agglutination tests made in parallel with those using the suspension of *Brucella abortus* C209. The usual type of agglutination clumps obtained with this antigen was finely granular. The clumps formed slowly during the 2-hour period of incubation at 37° C., and were not readily visible until the tests had been allowed to stand for 18 hours in the icebox at about 4° C.

The immune serum used as a positive control was obtained in several ways: 1. Abortus serum prepared at the State Laboratory at Albany by immunizing rabbits against *Brucella abortus*. 2. The mixture of the serums of rabbits immunized against *Brucella abortus* and *B. melitensis* prepared in this laboratory. 3. Serum from patients with undulant fever containing agglutinins for *Brucella abortus*. All of these serums had titers greater than 1–2,000 for the strain of *Brucella abortus*, C209, used in these tests. The rabbits were immunized by subcutaneous and intravenous injections of suspensions of killed *Brucella abortus*.

To provide for all use made of the reagents, 5,500 c.c. of antigen suspension were supplied and 33 vials of agglutinating serum were sent out.

RESULTS

Agglutination produced by a 1–100 dilution of the patient's serum was considered diagnostic or positive for undulant fever in this investigation. Of the 3,716 specimens reported upon, 64 gave agglutination in a titer of 1–100 or higher. The percentage of positive reactions in this series was, therefore, 1.72 per cent. Agglutination in some dilution of the serum, from 1–10 up to 1–10,000, was given by 165 or 4.44 per cent of the 3,716 specimens. With the exception of serums from two "old cases" of undulant fever, whose titers were 1–80, no specimen giving agglutination in a dilution less than 1–100 seemed to come from a case of undulant fever. These results are summarized in Table I.

In 10 cases of typhoid fever, the serum gave agglutination with the abortus antigen in 1–10 to 1–40 dilutions. On the other hand, 180 specimens from patients suspected of having typhoid fever were entirely negative. It is probable that an undetermined number of these patients actually had typhoid fever. These results bearing on the specificity of the agglutination reaction for the diagnosis of undulant

TABLE I

RESULTS OF AGGLUTINATION TESTS FOR UNDULANT FEVER

COÖPERATIVE INVESTIGATION BY NEW YORK STATE LABORATORY ASSOCIATION

January 1 to December 31, 1929

Laboratory	Positive Agglutination Reactions					
	in dil. 1–100 or more	in dil. less than 1–100	*B. melitensis* only 1–20	False Pos.	Negative	Total Tests
1. Binghamton State Hospital Binghamton	1				1	2
2. Buffalo City Hospital Buffalo	1				5	6
3. Buffalo Health Department Buffalo	4	2		3	228	237
4. Cattaraugus County Lab. Olean	3	6			89	98
5. Cayuga Co. Bact. Lab. Auburn					6	6
6. Letchworth Village Lab. Letchworth Village					41	41
7. Merkel Memorial Laboratory Plattsburgh	1				129	130
8. Montgomery County Lab. Amsterdam					41	41
9. New Rochelle Hospital Lab. New Rochelle					270	270
10. New York State Laboratory Albany	34	36	8	1	687	766
11. Otsego County Lab. Cooperstown					93	93
12. Rochester Health Bureau Lab. Rochester	7	27			1,027	1,061
13. St. Joseph's Hospital Lab. Elmira		3			64	67
14. Steuben County Lab. Corning	6	1			12	19
15. Utica City Lab. Utica	2	8			293	303
16. Warren County Lab. Glens Falls	4	3			440	447
17. Yonkers Bureau of Labs. Yonkers	1	7			121	129
Totals	64	93	8	4	3,547	3,716

Pos. 1–100 or more 64 = 1.72 per cent
Pos. in any dil. 165 = 4.44 per cent

fever have significance in connection with the large amount of negative evidence included in the reports received during this investigation. The report cards listed 95 different clinical diagnoses, including most of the infectious diseases and many obscure febrile conditions. Among these reports of specimens giving negative undulant fever agglutination

tests, there were listed 126 cases of syphilis, 55 cases of pregnancy, 10 cases of abortion, 15 cases of pelvic inflammatory disease, 33 cases of pneumonia, 20 cases of arthritis, 31 cases of tuberculosis, 46 cases of cardio-renal disease, and 16 cases of enteritis. The great variety of conditions in this series in which no agglutinins against the abortus organism were found indicates that this agglutination test has a relatively high degree of specificity.

False reactions were occasionally obtained with serum containing hemoglobin. The experience of Dr. C. A. Bentz, in Buffalo, and of those at the State Laboratory at Albany, indicates definitely that "hemolized serums" may give false reactions in dilutions as high as 1–320. Two such cases were carefully investigated by Dr. Bentz. These specimens were from patients with typhoid fever. In these cases the agglutinin titer was 1–320 with specimens of serum showing the results of hemolysis. Two days later, specimens free from hemoglobin, from both of these patients, gave absolutely no agglutination. From this experience, it is evident that positive agglutination in hemolized serum should not be accepted as diagnostic until confirmed with serum free from hemoglobin.

Of the 64 "positive cases," one originated in Pennsylvania. The remaining 63 were distributed throughout the following 28 counties of

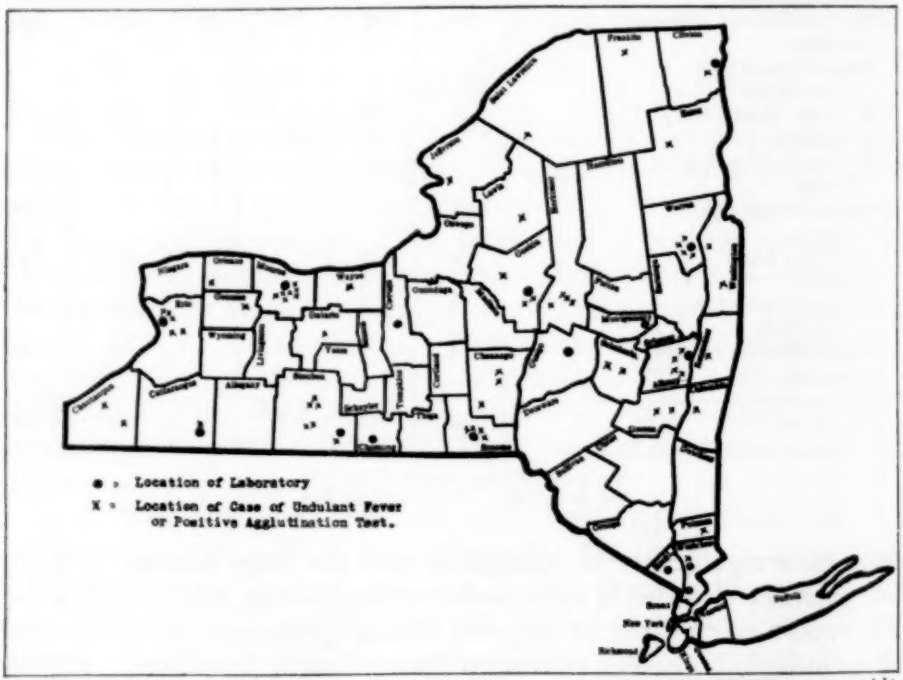

FIGURE I

Base CLEARTYPE map, copyright, American Map Co., New York

New York State: Albany, 4; Broome, 4; Cattaraugus, 1; Chautauqua, 2; Chenango, 3; Clinton, 1; Columbia, 1; Erie, 5; Essex, 1; Franklin, 1; Genesee, 1; Greene, 2; Herkimer, 4; Jefferson, 1; Lewis, 1; Monroe, 7; Oneida, 3; Ontario, 1; Orleans, 1; Putnam, 1; Rensselaer, 1; Saint Lawrence, 1; Schoharie, 2; Steuben, 6; Warren, 4; Washington, 2; Wayne, 1; Westchester, 1. While there are undoubtedly focuses of undulant fever in New York State, this survey is inadequate to indicate their location. It suggests, however, that there may be an unusual prevalence of the disease in the counties of Monroe, Albany, Broome, Warren, Erie, Steuben, and Herkimer. In most of these counties, the presence of a large laboratory engaged in active investigation may be responsible for the greater number of tests and therefore a greater number of positive findings. In view of this and other possibilities, it would be unwarranted to use these statistics for more than they purport—namely, a location of patients whose serums give positive agglutination tests for undulant fever.

The age group distribution of patients in this series from whom serum was obtained giving positive agglutination reactions with *Brucella abortus* is much the same as that found in other similar investigations. Most of the positive reactors, 53 per cent, were in the age group 15 to 39 years. No children in the first year of life and only 1.6 per cent of children under 10 years of age gave positive reactions. As the specimens were drawn largely from adults, it is not justifiable to accept this difference as indicating the actual difference in incidence of the disease in persons in these age groups. Nevertheless, the conformity of these figures with those of others who have studied this problem is noteworthy. Undulant fever in this country is undoubtedly most common in adolescents and young adults.

More males than females gave positive reactions. The percentage of males (65.8 per cent) was twice that of the females (32.8 per cent). While no statistical studies have been made to determine the correlation of positive reactors according to sex with the proportions of the sexes in the whole series, it can be stated that there was no great excess of males among those from whom the specimens were taken. This higher incidence of positive reactions among males has been brought out repeatedly in studies of the incidence of undulant fever.

Among the occupations of the patients whose serums gave positive agglutination tests, farming was the one which was most often associated with undulant fever. Farmers and their wives made up 23.2 per cent of those who gave positive reactions. The incidence among those on farms is in fact somewhat higher than this, as a number of others who followed a principal occupation other than farming lived on farms.

TABLE II

DISTRIBUTION ACCORDING TO AGE, SEX AND OCCUPATION

	Number	Per Cent Approximate
Ages, in years		
Birth to 1	0	0
2 to 9	1	1.6
10 to 14	2	3.2
15 to 19	7	10.9
20 to 29	12	18.7
30 to 39	15	23.4
40 to 49	8	12.5
50 to 59	5	7.8
60 to 69	5	7.8
Not reported	9	14.1
Total	64	100.0
Sex		
Male	42	65.6
Female	21	32.8
Not reported	1	1.6
Total	64	100.0

	Number	Per Cent Approximate
Occupation		
Chauffeur	2	3.2
Clerk	3	4.6
Farmer	11	17.1
Farmer-Housewife	4	6.2
Fireman	2	3.2
Housewife, rural and urban	14	21.8
Laboratory worker	1	1.6
Laborer	4	6.2
Manufacturer, merchant, metal-worker, salesman, storekeeper, teacher, wood-worker (one each)	7	10.9
Veterinarian	1	1.6
School children	5	8.0
Not stated	10	15.6
Total	64	100.0

In a few of the cases, an investigation was made of the milk supply of the patients giving positive agglutination reactions. Since this was not done in all cases, it is impossible to make a definite statement on the relationship of the use of raw or pasteurized milk, and the handling of cows to the incidence of undulant fever among the 64 cases listed in this series. The drinking of raw milk, the use of raw milk from cows in herds in which infectious abortion occurred, the milking of cows, and assistance in the delivery of calves, were frequently noted in reports on patients whose milk supply and habits were investigated. In a few cases, no evidence of the use of raw milk or contact with cattle could be obtained. Contact with swine was infrequent. Blood cultures were made in only 9 of the 64 cases. From 2 of these, organisms of the *abortus-melitensis* group were isolated. Whether these organisms are of the caprine, bovine or porcine type has not yet been determined.

Since the conclusion of this investigation, the question has arisen as to what may be expected from routine agglutination tests for undulant fever with all specimens of serum received at a laboratory. It is difficult to determine from examination of the records exactly how many positive reactions were obtained with specimens from patients whose illnesses did not arouse some suspicion that they might be due to the bacterium of undulant fever. Certainly, such cases were in one sense very few, and will undoubtedly become fewer now that attention is increasingly directed to the possibility that prolonged, irregular fevers,

arthritis, debilitated states, and intestinal and abdominal disorders may be manifestations of undulant fever. In such cases, it should become a routine procedure to examine the serum for agglutinins for organisms of the Brucella group. A few positive reactions will be obtained with serums in the general run of specimens submitted for serological tests for the diagnosis of syphilis. But the results of this investigation indicate that the physician and the laboratory can obtain information of the greatest value by having agglutination tests done in all cases of obscure fevers, and also in many periodically febrile cases in which the clinical diagnosis was that of probable tuberculosis, probable typhoid fever, probable "rheumatism" and probable malaria.

SUMMARY AND CONCLUSIONS

During the year 1929, 17 laboratories in the New York State Association of Public Health Laboratories undertook a coöperative investigation of undulant fever. The work was limited to the performance of the agglutination test with serums submitted to the laboratories for any purpose. An antigen composed of a suspension of killed *Brucella abortus* was used and a standard procedure was followed by all of the laboratories engaged in this work. Supplies were sent out from and reports were returned to a central laboratory. The investigation proceeded according to plan without difficulty, demonstrating that laboratories of this type, under directors appreciative of the value of investigation, could coöperate in a joint enterprise and obtain from the work information of both local and general value. While not an epidemiological study of undulant fever, this investigation furnishes some additional and confirmatory information on the incidence and distribution of the disease in New York State.

Reports were made on agglutination tests with serums from 3,716 patients. Of these, 64, or 1.72 per cent, gave positive agglutination reactions with the *Brucella abortus* antigen. All except one patient lived in New York State. While the final diagnosis in some cases had not been made, this investigation seemed to indicate that all of these were cases of undulant fever.

Agglutination reactions with dilutions less than 1–100 were obtained with 93 specimens of serum. With the possible exception of 2 old recovered cases of undulant fever, the diagnosis of undulant fever was not made in these cases.

Some degree of agglutination with the abortus antigen or melitensis antigen was obtained with 165 serums (4.44 per cent).

False positive reactions were given with serums containing hemo-

globin. No other known false positives occurred among many specimens from patients suffering from a great variety of diseases.

Among the patients whose serums gave positive reactions, those between the ages of 15 and 39 were most numerous (53 per cent). Males occurred in the series twice as often as females. Farming and occupations associated with farming and cattle raising were the occupations most frequently associated with positive agglutination reactions for undulant fever in this series. While the drinking of raw milk and contact with cows in herds having infectious abortion could be established in nearly every case in which a positive agglutination reaction was found, there were some instances in which these factors could not be shown to exist. The reports do not furnish information on the milk drinking habits and association with cattle of the 3,547 patients whose serums gave no agglutination with the abortus antigen. Contact with swine was infrequent and unimportant according to the reports on the cases in this series.

The discovery of cases of undulant fever was made through the use of the agglutination test. The experience of this investigation, however, indicates that very few positive reactions will be found from tests with the serums submitted for serological tests for syphilis in the ordinary course of medical practice. On the other hand, valuable and often decisive information will be obtained from routine agglutination tests with serums from patients suffering from obscure and periodical fevers, arthritis, intestinal and abdominal disorders, and with suspected tuberculosis and typhoid fever. It seems advisable to have this test performed as a routine procedure in many of these febrile conditions even when the clinical diagnosis has an aspect of assurance.

The Ganges and Public Health

THE year 1930 was marked by one of the largest religious festivals in India, which is held every 12 years, and which brought to Allahabad three and one-half million pilgrims, two and one-half million of whom bathed on the same day, January 29, in the Ganges. Great preparations had been made to assure the distribution of pure water, to ferret out the sick and place them in hospitals, and to increase the vaccinations. Only 168 cases of cholera were treated, and cholera was less frequent in India during the following two months than during the corresponding period of the preceding years.—*Pub. Health Rep.*, Nov. 7, 1930.

The Industrial Nurse in Gear with the Machinery for Human Adjustment*

VIOLET H. HODGSON, R. N.

Assistant Director, National Organization for Public Health Nursing, New York, N. Y.

THE basic objective of all public health nursing is the satisfactory adaptation of the individual to an environment that makes health possible. The adaptation may be physical, mental, spiritual, social or economic. Whichever it may be, each must be considered in relation to all the others if we wish to obtain an harmonious adjustment of the integral parts of the human machine. The environment may be the home, the school, or the plant. Each offers peculiar situations to which the human machine must be adjusted if production of all things necessary to health and happiness is to reach its maximum.

If industrial nursing shares this basic objective with other activities in the field of human adjustment, it immediately becomes evident that the service is not that of a simple one-unit machine, but a part of that more complex mechanism designed to produce the most satisfactory adjustment of the individual to his environment, which is naught else but the attainment of individual maximum capacity for production in the plant, the home and the community. It simply means that the industrial nurse must be in gear with this machinery for human adjustment. Coördination and proper sequence of all the gears in the community health machinery are essential in order to attain the maximum speed in making productive human adjustments with a minimum of friction and lost effort. The industrial nurse has a very real contribution to make to this process within and without the plant, if she is "timed" to perform her part in "proper sequence" with all the other agencies.

WITHIN THE PLANT

The intra-plant relationships are admirably expressed by Bruere and Pugh in their definition of industrial relations: "The modern art of industrial relations is the act of courteous, coöperative accommodation of interests between employers and employees with a view to the successful operation of the business in which they are concerned."

* Read before the Virginia State Nurses Association, Virginia Beach, Va., May 23, 1930.

The health service of the nurse can be a real factor in increasing the effectiveness of such a program, if a coöperative relationship is maintained with the groups responsible for the administration of its various services.

The average worker is interested essentially in his earnings upon which he depends for the material things necessary for his health and comfort. About one-third of his time is spent in business. Modern management, although primarily interested in the quality and quantity of production of goods, has long since recognized that the healthy and happy worker is the greatest asset in attaining these objectives. The nurse in industry has the interests of both groups in mind and consequently makes her greatest contribution through the integration of her services toward the ultimate goal of satisfactory human relations within the plant.

The Physician—Through the practice of her nursing skills in the care of the sick and injured, under the direction of a physician, she helps the worker in reducing time that might otherwise be lost from minor accidents and injuries. This is a service of interest to employer and employee. Of more importance, though less accurately measurable, is her opportunity for prevention of incapacitating physical conditions, through education of workers in matters pertaining to health, and guidance in securing necessary medical service, both diagnostic and remedial.

The Safety Engineer—If the nurse is acquainted with, and interested in, the objectives of the safety engineer, she can assist him in interpreting his program of accident prevention to the worker and secure to the latter the means whereby he can coöperate most effectively in developing and promoting safety measures. No better opportunity is provided for doing concrete teaching than at the time when the employee is suffering from an infraction of the safety rules. Wise instruction at this time will enlist the active interest of the worker as a disciple of the gospel of prevention which he can share with his fellow workers. In like manner, keen observation and analysis of conditions which come to her attention in the first aid room will disclose many situations which should be called to the attention of the safety engineer for correction.

The Personnel Manager—The personnel manager recognizes the importance of mental health as well as physical in the satisfactory adjustment of the worker to his job. Production depends on adjustment to the work, fellow workers, and the foreman. Lack of understanding will result in excessive friction in the human machine with its concomitant loss of energy and, in extreme cases, in the eventual

breakdown of the machine itself. Recent studies in industrial fatigue have revealed the amazing influence of psychological factors in fatigue and variations in production. Rest periods have been found to relieve the monotony of repetitive processes, but release from disturbing mental factors has transcended the effects of physical rest. The opportunity to talk about anything that is troubling him has been, in many cases, all that was necessary to restore the worker to his original capacity for production. In the study, carefully selected individuals were chosen to provide this service to the employees. Although, at the present stage of the experiment, this would seem to be the ultimate function of the foreman, the part which the nurse can play in such a program has not been lost sight of. Through a sincere interest in the employee she should be able to gain his confidence so that he will seek her counsel in matters of mental and social as well as physical adjustment.

Public health nursing in industry is indeed but one of the many gears in the plant machinery for adjusting the employee satisfactorily to his environment.

IN GEAR OUTSIDE THE PLANT

Thus far it would seem as though our conception of the health needs of the employee depended entirely on the plant environment and his relation to it. Such is far from being the case. As a social being, the job is but the means whereby he can develop those instinctive social relationships upon which the whole structure of society depends. Participation in family and community life is essential in the well balanced life of the worker. Maladjustments of the parts of this machinery are reflected in the "loss of power of the driving wheels" in the plant.

Illness in the home may result in physical and emotional fatigue which inhibits the employee's output in the plant. In order to serve the interests of employer and employee most effectively, it becomes the responsibility of the nurse to take into consideration the needs of the employee in the home in so far as their influence affects his welfare in the plant. To do this requires a knowledge of the facilities available in the community for hospitalization, care of the sick in the home, and supervision of the health needs of each age group.

Furthermore, so closely can her teaching in the fundamental principles of personal and plant hygiene coincide with those of the visiting nurse and school nurse that we can truly speak of the joint efforts of all public health nurses in terms of a family and community health program. This objective can only be attained through close relation and adjustment of the parts in the community health machinery.

Personality difficulties are not confined to contacts outside the home. Management is aware of the unproductive friction caused by maladjustment of the employee to his fellow workers and to the foreman. Similar, and perhaps more devastating, waste results from social maladjustments outside the plant. Accidents are not always the result of ignorance and deliberate breaking of the safety rules. Mental preoccupation with an unhappy marital relationship may divert the mind of the employee just long enough to cause him to forget to replace the guard on the machine which later produces the injury. It is the wise nurse, with sound judgment and a real human interest, who will be able to sense situations which contribute to the problems of accident and illness observed in the plant, and who can act as a counselor without arousing the antagonism of the worker.

Modern management is averse to interference in the affairs of the worker outside the plant—and rightly so. On the other hand, helping the worker to help himself is but a fundamental principle upon which constructive health and social work is based, and in no wise partakes of the nature of paternalism. It is here that the art of human relations must be exercised with the greatest skill, if the nurse wishes to be of greatest service. Wise guidance to the community facilities available for administration of the service most needed at the time is all that devolves upon the nurse. Knowledge of and coöperation with the community machinery are prerequisites for the proper relationship of the gears in the machinery for such human adjustment.

The employee who comes to the nurse with problems of delinquency, lack of parental control, need of hospitalization, and other situations in the home, should expect guidance which conforms with the best accepted practices within that community. The advice of the industrial nurse should not run counter to that of other health agencies but should reinforce in the mind of the worker the instruction which his family may have received from the administering agency. Not infrequently it becomes her privilege to "close the sale" of a family health program. The preventive program of the local health department may offer exceptional opportunities for the plant nurse to assist in the prevention and control of communicable diseases.

Even of greater importance do these relationships become when we realize that health service in industry is largely confined to plants with 250 or more employees on the pay roll, and that a vast field remains uncovered in the smaller establishments, whose combined employment is slightly less than 50 per cent of the total. Here would seem to be a splendid opportunity for the local public health nursing association to extend its health services to all the members of the family, and in so doing might appropriately consider the necessary adjustments of their

program and the other community health machinery to meet the needs of industry.

The nurse in industry is one of a large group of health workers who has especial opportunity to emphasize the preventive rather than the curative aspects of disease. If the nurse is to keep pace with the progress that is being made in public health nursing, and if she expects her industrial nursing program to meet the needs of modern preventive medicine, it is of the utmost importance that she not only belong to her state and national nursing organizations, but that she contribute to their programs and share her experiences with her coworkers.

The nurse in industry profits by the stimulation that comes from discussing her problems with other workers in the public health field. The viewpoint of others is invaluable in broadening her own, and the entire group needs her contribution in developing and improving standards in the public health field.

CONCLUSION

Thus far our topic has been treated from the positive point of view, assuming the industrial nurse was in gear with the machinery for human adjustment in the plant and in the community. Unfortunately, there is a negative aspect, analogous to the situations found in maladjustment of the gears in a machine. "Too much play between the teeth of the meshing gears," "stripping of the gears," "lack of care in operation," and "unrelated gears," each, in turn, produces a condition in which "coördination and proper sequence" are interfered with, resulting in lost energy and interruption of power transmission from the motor to the drive wheels. Loss of time in reporting problems to other agencies, unwillingness to coöperate, resulting in a clashing of interests, neglect of the routine procedures of reporting, which are the mechanics of coöperation, and uncoördinated objectives are the counterpart situations in the machinery for human adjustment which result in a lessening of production and efficiency in helping the individual make a satisfactory adaptation to his environment.

As the efficiency of the plant machinery depends upon the skillful supervision of the mechanic, so, too, does the effectiveness of our social machinery depend upon the art of administering to the needs of the human machine. To the nurse in industry is afforded unequaled opportunities for the development of this service, not alone through her professional ministrations, but likewise in the practice of that more fundamental service, the art of human relations.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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THE FORT WORTH MEETING

FOR its fifty-ninth Annual Meeting, our Association chose the great Southwest, selecting the thriving city of Fort Worth, the site of an old fort.

All the forebodings that the distance from the North and East would have an injurious effect on the attendance were shown to be unfounded. The registration was 1,139, which compares favorably with other meetings, except those in one or two of the large eastern cities.

Particular interest attached to this meeting on account of the fact that it was the first held since our reorganization in 1929, and the first for which the newly created Committee on Meetings and Publications had arranged. All of the different sections had excellent programs, many in the form of symposiums, some of which were unusually notable and of extreme value to public health workers.

The meeting was especially important, as it marked what might be called the re-entrance of our sister Republics to the south into our deliberations. As Dr. Silva, Chief of the Department of Public Health of Mexico, pointed out in his address, our country has gone through the greatest of world wars, and his country has gone through much suffering during recent years. It was altogether an auspicious occasion, and we may well rejoice at once again taking up the lines which are of necessity of common interest to us, and reviving the delightful friendships which did so much to make our Association truly international in character in the past.

For the first time in the history of the Association, important representatives of the Health Services of all of our constituent members, Canada, the United States, Mexico, and Cuba, were present. Mexico was represented by 23 delegates, headed by the Chief of the Department of Public Health and a number of his staff.

Canada had 18 delegates, with Dr. Amyot, Deputy Commissioner of Health of the Dominion at its head.

Cuba was represented by Dr. Aristides Agramonte, who was elected to Honorary Fellowship in the Association on account of his notable career, and who gave an excellent address at the final banquet.

The State of Texas and the City of Fort Worth excelled themselves in hospitality. Their greeting was most warm, and continued throughout the stay of the delegates. Certainly the far-famed hospitality of the South was exhibited at its best.

Over 200 went on the post-convention tour to the City of Mexico, and there was universal regret among the delegates that all of them could not take part in this, which will doubtless further cement the bonds of friendship.

AIR CONDITIONING FOR PREMATURE INFANTS

IT has long been recognized that one of the first prerequisites to start the premature infant on his way to independent existence is the conservation of body heat and energy. The necessity for maintaining a constant temperature accounts for the popularity of the small incubator, but very recent studies by Blackfan and Yaglou* show that moisture and an ample supply of pure air are equally important, and that they are more readily and adequately controlled in a room by means of general air conditioning than in a small incubator.

After a 4-year study of the influence of air conditions on the growth and development of premature and other delicate infants, these workers arrived at certain requirements from a consideration of 4 valid criterions: stability in body temperature, gain in weight, incidence of diarrhea and of mortality, and general behavior of the infants under various air conditions. The air conditions were obtained by means of a modern conditioning system capable of warming and humidifying the air in winter and cooling and dehumidifying it in summer to any desired degree, regardless of outdoor weather.

The application of such a system to the premature nurseries of the Infant's Hospital in Boston resulted in marked improvements in the care of these infants. Stabilization in body temperature was associ-

* The engineering aspects of this work have already been published in the *Heating, Piping, and Air Conditioning Journal* for 1930.

ated with reduction in the incidence of diarrhea and in the general mortality. Infections were reduced to a minimum and gains in body weight increased.

In order to keep the atmosphere free from odors and maintain the desired temperature and humidity, a ventilation rate of 25 air changes per hour was required, and this had to be effected with an air movement not exceeding 15 feet a minute in order to avoid drafts.

Although we do not know the physiologic significance of the relation of odors of human origin to general ventilation work, evidence seems to warrant the conclusion that there are substances in the air of unventilated occupied spaces—even when the temperature and humidity are controlled—which in some way are capable of producing headache, nausea, loss of appetite and a disinclination for physical activity. These are sufficient to warrant adequate ventilation, particularly in the case of premature infants who are much more susceptible to infection than adults.

In addition to the physical heat loss, the moisture content of the air was found to exert a profound physiologic effect upon these infants. When a relative humidity of 30 per cent—a considerably higher value than that prevailing in unconditioned nurseries during cold weather—was maintained for 2 weeks or longer, the body temperature became unstable, gains in weight diminished, the incidence of diarrhea increased and the mortality rose. On the other hand, continuous exposure to air conditions with 55 to 65 per cent relative humidity gave very satisfactory results over a 2-year period. The best relative humidity was found to be 65 per cent.

The requirements for temperature depended to a considerable extent upon humidity. When the humidity was fixed, the temperature varied according to the general constitution of the infants and their body weight. For normal prematures the variation was from a minimum of 75° F. for infants weighing 4½ to 5 pounds to a maximum of 88° F. for infants weighing between 1½ and 2 pounds. For congenitally diseased infants, the variation was from 76° F. to 100° F. This latter group was cared for in individual electric incubators placed inside the conditioned nurseries, and the heat adjusted according to requirements. In this way, the infants benefited from breathing the comparatively cool room air at about 65 per cent relative humidity.

The striking benefits are attributed not only to improved air conditions but also to advances in medical treatment and to improvements in nursing and general care. It is fair to conclude, however, that the introduction of mechanical air conditioning has proved a distinct advance in the care and treatment of premature infants.

THE TEETH AND DIET

IT is hard to escape the conclusion that oral hygiene is one of the neglected fields of preventive medicine. It is true that we have had toothbrush drills for some years and here and there an outstanding dental surgeon has raised his voice like "one crying in the wilderness." While the general facts as far as known have been more or less widely accepted, progress has been slow.

Miller, an American who did most of his work in Berlin, was one of the first to teach dental hygiene on what he considered a scientific basis. Following his views it has been generally held that caries depends upon conditions external to the teeth and it is hardly too much to say that even now the most prevalent idea is that carbohydrate stagnation is the chief cause of decay in teeth. The prevention of apical abscesses has not been successful while doctors and dentists, alike, have gone through an orgy of tooth pulling for the cure of practically all ailments for which some other definite cause could not be determined. Many types of toothbrushes and dentifrices fill our drug stores and advertisements pack the pages of current literature; yet it seems probable that conditions have not grown much, if any, better, unless the advice so widely given, to consult a dentist at least annually, has brought them about.

In England, where the dental conditions of children seem to be less favorable than in this country, the matter has engaged the attention of the Medical Research Council, largely on account of observations made by E. Mellanby in his epochal studies of rickets, during which he proved the power of the antirachitic vitamin, now known as D, and showed its controlling influence over calcification. Along with this he showed the injurious effect on calcification of certain cereals, especially oatmeal.

The extensive work of May Mellanby[1] has confirmed his findings and greatly advanced our knowledge along these lines. The proof has been given largely by experiments on dogs, but human studies are in progress, which so far have strengthened the conclusions drawn from animal work.

The teeth are a good index of calcification at varying periods during development, and not only their general development but their microscopic structure can be influenced and even determined by diet. Generally, foods containing a large amount of vitamin A are necessary; but D, which has now been shown to be a separate entity, is the determining factor and is found in varying amounts in foods containing vitamin A. It can be administered as found in such natural foods

as egg yolk, milk, and cod liver oil, or by irradiation of foods in which the ergosterol content is changed.

The production of perfect teeth also depends upon the presence of calcium and phosphorus in the diet. If the diet contains an abundance of vitamin D the required amount of these salts may be very small, but if the vitamin D intake is low extra calcium improves the teeth. In the absence of vitamin D perfect calcification does not take place no matter how much calcium and phosphorus is contained in the diet.

Sunlight may bring about the formation of good teeth even on diets which are defective, and irradiation has a similar effect, though improvement is not nearly so great as that produced by an abundant supply of vitamin D.

Certain cereals, especially oatmeal, seem to contain a material called by E. Mellanby "toxamin," which interferes actively with the normal development of teeth, but its evil effect is manifest only when there is an insufficiency of vitamin D, and is counteracted by an abundance of this substance. Exposure to sunlight, the good effect of which is recognized, has in some cases been ineffective when the diet contained a large amount of anti-calcifying substance. The amounts of calcium and phosphorus necessary for perfect calcification vary with the vitamin D content on the one hand and the toxamin content on the other. No explanation of this fact has yet been brought forward.

There are two practical applications of the facts brought out by this research. First, in point of time, is a proper diet for the mother during pregnancy and lactation, though it has also been shown that stored vitamins either in the mother or in the offspring may be utilized during a period of deficiency. The food which the mother receives affects not only the temporary but also the permanent teeth. The feeding of the offspring with an abundance of vitamin D is especially important for the permanent teeth, as the deciduous teeth seem to benefit by the vitamin stored in the mother's tissues before and during pregnancy and lactation.

It seems clear that by proper feeding of parents and young children defects in the structure of the teeth which are largely responsible for caries and other dental diseases may be avoided. The vast amount of dental disease which, in the aggregate, is one of the greatest sources of ill health can be appreciably prevented.

REFERENCE

1. Medical Research Council—*Special Report Series, No. 140.*

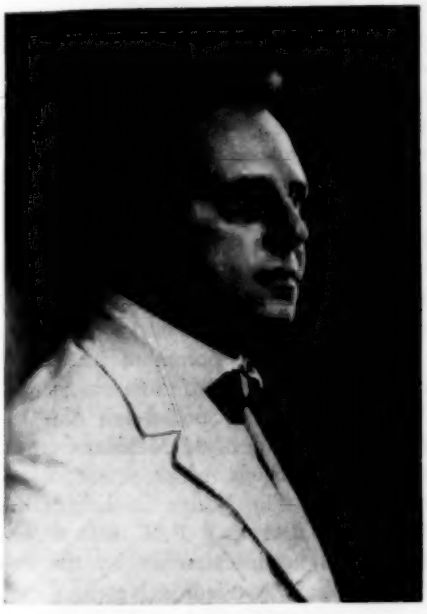
ASSOCIATION NEWS

SIXTIETH ANNUAL MEETING

MONTREAL, CANADA

SEPTEMBER 14–17, 1931

DR. AGRAMONTE AN HONORARY FELLOW



ARISTIDES AGRAMONTE, M.D.

ARISTIDES Agramonte, M.D., was made an Honorary Fellow by the Governing Council at its meeting on October 28, in recognition of his inestimable services in the determination of the method of the transmission of yellow fever and its control.

Aristides Agramonte was born on the field of battle at Camagüey, Cuba, June 3, 1869, his father being one of those patriots who lost their lives in Cuba's attempt to gain independence.

His early life was spent largely in New York. He received his Bachelor of Arts degree at New York University in 1886, and was graduated in Medicine from the College of Physicians and Surgeons in 1892. He served as Sanitary Inspector and Assistant Bacteriologist to the New York City Department of Health, and was appointed Acting Assistant Surgeon of the U. S. Army in 1898, being a member of the famous Board headed by Walter Reed which gave the final proofs of the relation of the mosquito to the transmission of yellow fever. Since 1900 he has been Professor of Bacteriology and Experimental Pathology at the University of Havana, besides holding many other positions, such as Secretary and Chairman of the Board of Infectious Diseases, member of the National Board of Health, Public Health and Charities, etc. In 1919, he was given the Breant Prize by the Paris Academy. He has served as delegate to many congresses in this and other countries.

While he is best known for his work in yellow fever, he has written also on plague, dengue, trachoma, malaria, tuberculosis, typhoid fever, the intermarriage of lepers, and other subjects.

In making him an Honorary Fellow, the Association has honored itself as well.

POST-CONVENTION TOUR OF THE A. P. H. A. TO MEXICO CITY, OCTOBER 30–NOVEMBER 8, 1930

EMERY R. HAYHURST, M. D., PH. D., F. A. P. H. A., AND WILLIMINA M. RAYNE

Ohio State University, Columbus, O.; and American Public Health Association, New York, N. Y.

THE American Public Health Association's Special of 14 cars, bearing 204 members including their families, left Fort Worth at midnight, Thursday, October 30, at the close of the Fifty-ninth Annual Meeting, for a 9-day, all-expense tour to Mexico City. This was on the invitation of Dr. Rafael Silva, Chief, Departamento de Salubridad Publica, and of President Rubio of the Mexican Republic.

At 9 A.M., Friday, October 31, the group arrived at San Antonio, Tex. A reception committee of San Antonio citizens was present with a large number of automobiles for a sight-seeing tour on the invitation of Dr. W. F. King, Health Officer. The automobiles for the trip were provided by the Bexar County Medical Auxiliary and the 3-hour itinerary included the ancient Spanish Palace, San Fernando Cathedral, the Alamo and its Court, once the "massacre fort," the famous Missions of the Conception and San José, the business center of the city with its modern skyscrapers, the famous Sunken Gardens and Japanese Tea Garden in Brackenridge Park, and a whirl through the residential and market sections.

An excellent luncheon was served in the patio of the old Hotel Menger through the courtesy of the Chamber of Commerce and the County Medical Society. The party was entertained with an orchestra and cowboy songs. Dr. W. F. King presided. The speakers were Mrs. J. E. King, President of the Bexar County Public Health Association, Walter Walthall, President of the Chamber of Commerce, Mrs. Alex Adams, Major Mickie of the U. S. Army, William McIntosh, Editor of *The Light*, and Señor Enrique Santebanez, the Mexican Consul. On behalf of the delegation, Surgeon General Hugh S. Cumming, Dr. C. C. Young, Dr. A. H. Flickwir, and Dr. J. C. Anderson responded to the addresses of welcome. The Executive Secretary of the Association, who had accompanied the group thus far, left it to return to Fort Worth.

In the afternoon, a number of the members of the delegation accepted invitations to speak in the public schools in San Antonio, while trips were arranged to the sewage works, the water works, and other points of interest as befitted the desires of different groups.

At 4 P.M. the Special left San Antonio with a staff of 36 Mexican porters, waiters, cooks, bath-car attendants, a maid, etc. The bridge at Eagle Pass was negotiated at 9 P.M. with a welcome and no interference by the customs officials at Piedras Negras.

The delegation arrived in Monterrey next day at 12:30 P.M., and was met at the station by a military band. Dr. Silva, Dr. Miranda, Dr. Baez and other representatives of Mexico who had attended the Fort Worth sessions joined the party here, where Dr. Silva's special car was attached to the A. P. H. A. Special. The weather was murky in Monterrey and the delegates were thankful for the automobiles, driven by Mexicans and native Indians, and provided by the Medical Association of Mexico, from the depot to the Brewery Cuauhtemoc, where luncheon was provided. A city

orchestra and later a large military band filled the hall with resounding Mexican music. Dr. Guajardo welcomed the group, and Dr. B. J. Lloyd responded. From the luncheon building the delegation was taken to the beautiful new, white marble Federal Building, in which the offices and laboratories of the Health Department are located. Thence a trip was made to the hill site of Obispado or the Bishop's Palace from which a fine view of Monterrey is obtained with its circle of towering mountains. The itinerary was next through the residence section with its barred windows and doors and flat or mansard roofs, the American section, and back to the station whence the long train headed west to Saltillo, reached about 6 P.M. After a stop of 30 minutes, the train turned south with more mountain climbing through rugged areas of cactus, Joshua trees, etc., to the plateau of central Mexico. All night it seemed to be up and up.

All day Sunday, November 2, the train wound around mountain slopes, through defiles and over deep gullies, most of the time with two locomotives and with a most weird scenery of all varieties and sizes of cactus and "sticker" trees or mesquites, also sage and greasewood, but with never a pine or elm or other apparently deciduous plant in sight. What looked like apple trees were thorny huizaches. The great maguey cactus yields "pulque" and "tehuila," two native drinks of great renown. Occasional stops were made at interesting little adobe hamlets and villages with sometimes medieval haciendas and tiny chapels where the passengers intermingled with natives, most of whom had delicacies, cigarettes, chili or native wares to sell, and who posed their donkeys for photographs, although photographing certain domestic scenes was "taboo." Close inspection showed that what looked like willows were pepper trees or something else, and everything that grew seemed possessed of stickers. Gorgeous cosmos, daisies, morning glories and flowering bushes, trees and cactuses were on every side. Occasionally butterflies swarmed, but bird life seemed scarce. The train passed areas of desert land, lava deposits, and mazes of arroyos, always flanked with mountains on either side until near Mexico City where the plateau broadened out, lakes and streams appeared and great corn, wheat and alfalfa fields, sometimes irrigated, extended to the distant mountains with herds of horses, cattle, sheep, and goats.

The famous city of Queretaro with its ancient viaduct was reached about 2 P.M., Sunday, and Mexico City itself at 9:30. The original plan called for arrival at 1:30 P.M., and a folklore pageant "Hamarandecua" had been arranged for 4 P.M. at the outdoor theatre Centro Venustiano Carranza, under the auspices of the Federal District, but it seemed that the special train was too long for speed and the stations too short for its length, features which, coupled with the sudden illness of one of the members of the party, necessitated several stops, so that the pageant was missed—greatly to the disappointment of the delegation and we feel, also, of our Mexican hosts who had gone to special effort to arrange it for us. Speaking of sickness, however, the crowd was fortunate indeed as only 2 or 3 cases came to notice throughout the 9-day period and these were not directly associated with the trip, which speaks well for the culinary service and care provided on the train and at the various luncheons and festivities. The Pullman cars were occupied as living quarters by all except a few who went chiefly to the Hotel Regis on the Alameda. In fact, not a few occupied the same train berths for 10 to 11 days, i.e., back to St. Louis and New York City.

In order to have a quiet sleeping place in Mexico City the A. P. H. A. Special

was side-tracked into Buena Vista Station and the site proved most satisfactory. Taxies could be obtained for one peso (48 cents, American money) to practically any point in the city, but for all regular meetings and trips some 15 auto-buses were provided each accommodating about 20 persons.

On Monday, November 3, the delegation was taken on a tour of the elaborate new Federal Health Buildings, which are arranged in a horseshoe shape with a central garden, fountain, and pond, and flanked in the rear with a large laboratory building. After the group had been photographed, it repaired to the library where the following program was given:

Address of Welcome. RAFAEL SILVA, M.D., Chief of the Departamento de Salubridad Publica (interpreted by Dr. Miranda).

Reply to Address of Welcome. HUGH S. CUMMING, M.D., Surgeon-General, U. S. Public Health Service, Washington, D. C.

History of Health in Mexico. ULISES VALDEZ, M.D., Secretary General, Departamento de Salubridad Publica (in Spanish).

Local Public Health Work. MIGUEL E. BUSTAMENTE, M.D., Director Public Health Unit, Veracruz, Ver. (in English).

After the addresses of welcome, the ladies of the party, who numbered nearly 100, at Madame Silva's invitation, left in motor cars for a sight-seeing tour of the city. This meant some event too, since Mexico City includes in its official bounds its suburbs. with a total population of about one million souls. About noon the groups met again at the Public Health Buildings and were conveyed in the auto-buses with the escort of the famous motorcycle squad of Mexico City which recently toured the States and also appeared in Hollywood motion pictures. In fact, members of the squad accompanied us on all of our trips, some of which were as much as 45 km. from the city, and we were constantly impressed with the expedition with which things moved. Contrary to the expectation of some of us, only a few soldiers were seen here and there while taxies of well-known American makes were really safer than in American cities. No traffic lights are seen in Mexico City, but the police stand on small boxes and direct traffic. Talk about being modern—nothing but motor vehicles (outside of bicycles, which are not numerous) are permitted on Mexico streets! Buses, street cars, automobiles and pedestrians keep up a continually changing scene everywhere, the main streets being broad and sunny. We had fine weather for all of our days in the city, which is at an altitude of 2,290 m. (7,444 ft.).

Our first sight-seeing trip was to Xochimilco. On the way out we stopped at the statue of Eduardo Liceaga on which a wreath was placed in his honor by Surgeon-General Cumming in behalf of the delegation, and the ever-present photographers were busy as ever. In fact, Mexican photographers are the most adroit in the world. Almost before you knew it, and indeed before they were dry, mounted photographs were for sale of each and every event and from all positions of vantage.

At Xochimilco a fine luncheon was served under the auspices of the Department of Public Health at the restaurant Las Flores, accompanied by orchestral music and Mexican songs. Dr. Ulises Valdez welcomed the party in Spanish, while Dr. Miranda in a fine flowing voice and an excellent command of English, acted as interpreter. Dr. Cumming responded in English. The party was then taken in small groups on gondolas for a tour of the canals between the tropical "floating islands," peopled and cultivated by Indian natives. Opportunity was also given to inspect the native Indian village.

We were then brought back to attend the reception at Chapultepec Castle, located on a rocky, conical hill

in the city, which was once the palace of Cortez and, before him, of the ancient Aztec rulers. Here each was given an opportunity to shake hands with President and Madame Rubio, a *tout ensemble* picture was made in the esplanade of the Castle, and guides were provided for a tour of the great building with its settings, rich in Maximilian lore, and of times before him. Thereafter the evening was free, and many visited the Alameda and the market district.

On Tuesday morning, November 4, the buses met the party in front of the station for an inspection trip of the buildings of the Federal Department, including the Institute of Hygiene, an infant clinic and maternity institute, and a tuberculosis dispensary. At noon, we left for the "Desert of the Lions," about 30 km. distant and at a considerable elevation, where the ancient Carmelite Monastery, of enormous dimensions, abandoned nearly a century ago, stands concealed in the heavy pine forest in a mountain gorge with its walls, gardens, and subterranean passages still in a fair condition of repair. Luncheon was served here in the open air under the shelter of huge trees and the great garden wall. This was under the auspices of Secretary of Public Works Gral. Juan Andrew Almazan. Dr. Grucman gave the address of welcome which Dr. Miranda interpreted. A chorus of five native male voices and a solo were splendid events.

At 4 P.M. the party left for the return drive to Mexico City. At 8 that evening, the group was invited to attend a concert at the Theatre Hidalgo, given by the Women's Symphony Orchestra. Following this there was a dance at the invitation of the Cosmopolitan Club in Chapultepec Restaurant —a great round, glassed-in building— where caballeros tripped with beautiful senoritas till 1 A.M.

On Wednesday, November 5, at 9:30 A.M., the group again went to the Department of Public Health, where the following scientific papers were read:

Address—B. J. LLOYD, M.D., Pan-American Sanitary Bureau, Washington, D. C.

Safeguarding a City Milk Supply. H. V. CARDONA, D.V.M., Supervisor of Milk Sanitation, Department of Public Health and Welfare, Fort Worth, Tex.

Because of Mrs. Silva's illness, her invitation to the ladies of the party to take a trip to Cuernavaca was cancelled, but independent tours were arranged by the Wells Fargo Company and in private conveyances. A goodly portion of the members made the trip of 75 km. over a splendid highway which soon reached elevations giving a splendid view of Mexico City and less distinctly of the great peaks, Popocatepetl and Iztacchihuatl. Finally the highway topped a mountain pass at 3,008 m. (9,850 ft.), to drop down into a fertile semi-tropical region on the west side of the mountains and into ancient Cuernavaca, where Cortez had his palace and gardens (now open to visitors) and where the summer home of Ex-Ambassador Morrow was visited. Some sought out the cathedral, others the narrow streets of the market and pottery venders; some enjoyed a native luncheon of tortillas stuffed with chicken and aguacates.

At 7 P.M. the doctors of the party were received by the doctors of the National Academy of Medicine, where Surgeon-General Cumming was decorated a Fellow of the National Academy. At 9 P.M. there was a concert of Mexican music and dancing at the Preparatory School given by the Department of the Federal District. Here one also had leisure to inspect the magnificent wood carvings and panels of the interior.

On Thursday morning, motor buses took the delegation to visit the clinic of the Department of Education, where nose, eye, ear, throat and skin diseases

are treated. Some rose early and visited the Cathedral—the largest in America—the National Museum with its great Aztec Calendar Stone and the San Carlos Art Gallery. Next, the party was conveyed to San Juan Teotihuacan, 45 km. distance, the place of the great Toltec Pyramids of the Sun and the Moon, and the lesser "Lights." After visiting the museum here, one walked the "Path of the Dead." Many ascended the Pyramid of the Sun. Some visited the Open-Air Theatre hedged about with tall organ cactuses. Some visited the excavated temple, Ciudadela, and saw the ornately carved Pyramid of Quetzalcouatl (the Feathered Serpent). Luncheon was served in the Grotto Restaurant, a great cavernous subterranean space well lighted by natural rocky apertures on one side. This luncheon was under the auspices of the Secretary of Public Education, whose representative greeted the party, and where Dr. Cumming replied on behalf of the delegation. Dr. Valdez spoke eloquently, and his speech was interpreted by Dr. Miranda. It was indeed a strange sight to see some 300 people seated at long tables in the Grotto with two Mexican orchestras occupying upper ledges, and the frequent explosions of the photographers' flash powders; nor will one soon forget the fine native songs of the entertainers.

On both the going and return trips to the Pyramids, the mists of Lake Tetzcoco were seen, blending with the distant sky. Stops were made at the Shrine of Guadalupe Hidalgo. On the outward trip some ascended the long stairway of the Convent Hill.

After dinner, served on the train—our meals were served in the two Pullman dining cars attached to the train—a Mexican band in grey uniforms filed through the station to the train platform while the delegation crowded the observation car and the various car entrances to hear "The Swallows," the Mexican farewell song, the strains of which accompanied our "Adios" to Mexico City as the train slowly pulled out into the darkness.

We were not long enroute before we discovered that Dr. Pruneda had delivered to the train innumerable gift packages, one for each member of the delegation, containing souvenirs of Mexican art. During the homeward trip an interested representative of the group in each car collected contributions for gifts for Dr. Silva and Dr. Miranda. The delegation also requested the Executive Board of the Association to draw up suitable resolutions expressing its appreciation of the hospitality of the Mexican officials, and their tireless efforts which had made the visit to Mexico City such an outstanding success.

At 5 P.M., on November 8, the special train reached Fort Worth, and members of the delegation went their separate ways, most of them carrying home a good tan from Mexican sunshine.

NEW MEMBERS

Health Officers Section

T. A. Callahan, Bel Air, Md., Assistant Deputy Health Officer
D. St. C. Campbell, La Plata, Md., Deputy State Health Officer
Eugene O. Chimene, M.D., Austin, Tex., Assistant Health Officer
John W. Copeland, M.D., Auburn, N. Y., Health Officer
Mordy A. Elstein, M.D., Lovington, New Mex., County Health Officer
Alva C. Hamblin, M.D., Brooksville, Fla., District Medical Officer, State Board of Health
Harvey B. Henry, M.D., Luling, Tex., City Health Officer
J. A. Jackson, M.D., Vernon, Ala., County Health Officer
A. C. Jones, M.D., Kingsville, Tex., City and County Health Officer
Sidney L. Kuposky, Dorchester, Mass. (Assoc.)
James D. Lowry, M.D., Fort Dodge, Ia., Member, State Board of Health
William J. MacDonald, M.D., Wellsburg, W. Va., County Health Officer
Bradford Massey, M.D., Pocomoke City, Md., Deputy State Health Officer
Crispin B. Matha, Ann Arbor, Mich. (Assoc.)
Rollin E. May, M.D., Lexington, Ky., Director, Fayette County Health Dept.
Charles W. McDonald, DeFuniak Springs, Fla., District Medical Officer
A. M. Morris, Langhorne, Pa., Health Officer
O. C. Pierson, St. Paul, Minn., Director, Division of Administration, State Board of Health
Edward L. Russell, M.D., Santa Ana, Calif., Deputy Health Officer, Orange County Health Dept.
William J. Sandidge, M.D., Shreveport, La., Director, Caddo Parish Health Unit
A. C. Shamblin, M.D., Cartersville, Ga., Commr. of Health, Bartow County
Hugh H. Shaw, M.D., Utica, N. Y., Health Officer
W. H. Sory, M.D., Jacksonville, Tex., City Health Officer
F. K. Soukup, M.D., Port-au-Prince, Haiti, Public Health Officer, National Public Health Service
I. C. Sumner, M.D., Chatom, Ala., County Health Officer
J. W. Wallace, M.D., Douglas, Ga., Health Commissioner
Edward M. Williams, M.D., Oskaloosa, Ia., Health Officer

Vital Statistics Section

Maria Doyle, Phoenix, Ariz., Vital Statistics Dept. Bookkeeper (Assoc.)
Paris R. Eastman, New York, N. Y., with Metropolitan Life Insurance Co.
Mrs. Anna Galbraith, Phoenix, Ariz., Statistician, State Board of Health
Mrs. Naomi P. Goodin, Jefferson City, Mo., Statistician, State Board of Health
Mrs. Marie B. Strassburger, Sacramento, Calif., Registrar of Vital Statistics

Laboratory Section

Harry E. Braun, M.D., Houston, Tex., Pathologist, Jefferson Davis Hospital
Cooper Brougher, Selma, Ala., Director, State Branch Laboratory
Elizabeth C. Brown, St. Louis, Mo., City Dept. of Health Laboratory
Eleanor Bullock, Albuquerque, N. Mex., Bacteriologist, State Public Health Laboratory
H. L. Burger, Lawrence, Kans., City Bacteriologist
Fred Cadham, M.D., Winnipeg, Man., Bacteriologist, Manitoba Medical College
Gertrude E. Connor, Lansing, Mich., Bacteriologist
Jane B. Currie, Tallahassee, Fla., Director, State Board of Health Laboratory
Margaret M. Diehm, Ph.D., Philadelphia, Pa., Instructor in Bacteriology
Martha O. Eckford, Sc.D., Columbus, Miss., Professor of Bacteriology and Hygiene, State College for Women
Wilson D. Elliott, Ottumwa, Ia., Milk Inspector, Bacteriologist for Water Works
Richard V. Goslau, Cedar Grove, N. J., Laboratory Technician, Dept. of Health
Walter T. Harrison, Washington, D. C., Surgeon, U. S. Public Health Service, National Institute of Health
D. E. Hasley, Detroit, Mich., Instructor
Harriet C. Hollon, Grand Rapids, Mich., Bacteriologist, Dept. of Health
Roberta Lovely, Montclair, N. J., Bacteriologist, Dept. of Health
Margaret MacLanahan, Butte, Mont. (Assoc.)
Ora M. Mills, Houghton, Mich., Assistant Director of Laboratories, State Dept. of Health
Mary P. Moffett, Elmhurst, Pa. (Assoc.)
William B. Sarles, Ames, Ia., Instructor in Dairy Bacteriology, Iowa State College
Morris F. Shaffer, Cambridge, Mass., Instructor, Massachusetts Institute of Technology
Pauline K. Smith, Ann Arbor, Mich. (Assoc.)

Beulah Teter, Monrovia, Calif., Bacteriologist, City Health Dept. Laboratories
Alvina L. Todd, R.N., Paterson, N. J., Nurse, St. Joseph's Hospital
Henry Welch, Ph.D., Hartford, Conn., Research Biologist, State Dept. of Health
Hannah Wollack, Oklahoma City, Okla., State Bacteriologist
Dr. Jose Zozaya, Glenolden, Pa., with Mulford Laboratories

Industrial Hygiene Section

Frederick W. Jackson, D.P.H., Winnipeg, Man., Deputy Minister of Health

Public Health Engineering Section

James D. Brew, Ph.D., Albany, N. Y., Milk Specialist, State Dept. of Health
Marion L. Christ, Los Angeles, Calif., Associate Engineer
H. J. Darcey, Oklahoma City, Okla., State Sanitary Engineer
James D. Fowler, Dallas, Tex., Consulting Sanitary Engineer
Edward Groeniger, Columbus, O., Consulting Sanitary Engineer
Robert E. Hackley, Palo Alto, Calif., Civil Engineer
Charles M. Harrison, Houston, Tex., Chief Sanitary Inspector, City Health Dept.
James T. Holahan, Rochester, N. Y., Contractor, Sewers and Disposal Plants
Thomas Holahan, Rochester, N. Y., Contractor, Sewers and Disposal Plants
Ralph E. Humphries, Pasadena, Calif., Acting Chief District Sanitary Inspector
J. A. LePrince, Memphis, Tenn., Malaria Control Invest., U. S. Public Health Service
George R. MacLeod, Montreal, Que., Assistant Chief Engineer
Lester D. Matter, Chicago, Ill., Engineer, International Filter Co.
John R. Menzies, Montreal, Que., District Engineer, Dept. of National Health
James P. Miller, Houston, Tex., Sewage Disposal
Malcolm Pirnie, New York, N. Y., Consulting Engineer
Hood Pitts, Austin, Tex., Consulting Engineer, State Board of Control
Charles L. Pool, Providence, R. I., Chief Engineer, State Public Health Comm.
Phil O. Purdum, Amarillo, Tex., Manager, Steffen Ice & Ice Cream Co. (Assoc.)
F. A. Schramm, Dallas, Tex., District Sanitary Engineer, State Dept. of Health
Francis J. Sette, Blacksburg, Va., Assoc. Professor of Sanitary Engr., Va. Polytechnic Inst.
Harry C. Sinks, Salem, Ore., County Sanitary Officer
Richard G. Thomas, San Antonio, Tex. (Assoc.)
L. E. Winder, Nacogdoches, Tex., City Sanitary Officer
W. W. Young, New York, N. Y., Consulting Engineer

Food, Drugs and Nutrition Section

Samuel Abraham, New York, N. Y., Milk Inspector, City Health Dept.
James J. Cooney, New York, N. Y., Inspector of Foods, Dept. of Health
William L. Dougherty, New York, N. Y., Inspector, Dept. of Health
Harry H. Field, New York, N. Y. (Assoc.)
N. S. Grubbs, Detroit, Mich. (Assoc.)
W. P. B. Lockwood, Boston, Mass., Mgr. Director, N.E. Dairy and Food Council
Malcolm J. MacLeod, Brookline, Mass., Food and Drug Chemist
John Pierson, Orlando, Fla., Health Inspector

Child Hygiene Section

Ruth C. Bartlett, Hartford, Conn., Supv. Child Health Work, Visiting Nurses Assn.
Vera C. Caldwell, Phoenix, Ariz., Public School Nurse
Mrs. J. M. Chase, San Antonio, Tex. (Assoc.)
Mrs. S. P. Cunningham, San Antonio, Tex. (Assoc.)
Ellen L. Lytle, Cambridge, Mass., Research Assistant, Massachusetts Institute of Technology
Joseph F. Paulonis, M.D., Brooklyn, N. Y., Pediatrician, Bushwick Hospital
Anne B. Price, New York, N. Y., School Health Bureau, Metropolitan Life Insurance Co.
Albert B. Siewers, M.D., Syracuse, N. Y., Psychiatrist, Preschool Dept. of Health

Public Health Education Section

Edwin Boonstra, D.D.S., Traverse City, Mich., Public Health Dentist
Fannie M. Brooks, Urbana, Ill., Asst. Prof. Home Economics, Univ. of Ill.
P. H. Byrns, St. Louis, Mo., Exec. Secy., St. Louis Chapter, American Red Cross
Curtis L. Cohee, Philadelphia, Pa., Exec. Secy., Phila. Inter State Dairy Council
Hart M. Devenney, Montreal, Que., Director, Recreation and Phy. Ed., Southwestern Y. M. C. A.
Matilda Dreifus, New York, N. Y., Headworker, Federation Settlement
Helen B. Fenton, Santa Rosa, New Mex., County Public Health Nurse

Clyde D. Frost, M.D., Chicago, Ill., Associate for Medical Services, Julius Rosenwald Fund

Adrian G. Gould, M.D., Ithaca, N. Y., Asst. Prof. of Hygiene, Cornell Univ.

Gertrude Greul, Boston, Mass., Exec. Secy., Norfolk County Health Assn.

Gordon Hastings, M.D., Little Rock, Ark., Dir., Rural San., State Board of Health

Mildred C. Hecker, R.N., Altoona, Pa., Exec. Secy., Blair County Tuberculosis and Health Society

Burt B. Ide, D.D.S., Baltimore, Md., Dental Member, State Board of Health

Lewis S. Jordan, M.D., Granite Falls, Minn., Supt., Riverside San.

Sadie Jordan, Royal Oak, Mich., City Health Nurse

Lucy M. Kennedy, Augusta, Ga., Supv. of Mouth Hygiene, State Board of Health

Gertrude Lingham, Madison, Tenn., Instructor, Dept. of Nursing Education, George Peabody College for Teachers

William H. Luedde, M.D., St. Louis, Mo., Member, Advisory Comm., National Society for Prevention of Blindness

Rufus A. Lyman, M.D., Lincoln, Nebr., Dean, College of Pharmacy, Univ. of Nebraska

Violet B. Marshall, Berkeley, Calif., Dir., Dept. of Phy. Ed. for Women, Univ. of California

Elizabeth Merrill, Parkersburg, W. Va., Public Health Worker

May I. Millbrook, M.D., Urbana, Ill., Member of Staff, Univ. of Illinois

Winifred Moses, New York, N. Y., Exec. Secy., Health Program for Women's Ed. Org.

Pat I. Nixon, M.D., San Antonio, Tex., School Physician

Margaret B. Pierce, Bronxville, N. Y., Health Dir., Sarah Lawrence College

Frank X. Rathgeber, Brooklyn, N. Y., Charge, Country Milk Inspection

Ferdinand O. Reinhard, M.D., Baltimore, Md., Acting Dir., Bur. of Comm. Dis., City Health Dept.

Emmeline J. Renis, R.N., Houston, Tex., Exec. Secy., Houston Anti-Tuberculosis League

William H. Ross, M.D., Brentwood, L. I., Pres., Suffolk County Board of Health

Jules V. Roule, M.D., Augusta, Ga., Instructor, Dept. of Prev. Med., Univ. of Georgia

Dr. R. W. Rutherford, Wichita Falls, Tex., Dairy Inspector

Harry A. Salzman, M.D., Chicago, Ill., Dispensary Physician, Mun. Tuberculosis San.

Everett S. Sanderson, Ph.D., St. Louis, Mo., Asst. Prof. Bacteriology and Public Health, Wash. Univ. Med. School

Henry Schoeneck, Syracuse, N. Y., Professor of Obstetrics

Alfred Seale, Palo Alto, Calif., Chairman, Board of Public Safety

Mrs. Joe H. Smith, Lubbock, Tex., Supv. of Health Ed., Public Schools

George E. Snyder, Johnstown, Pa., Instructor, Univ. of Pittsburgh

Mrs. Ralph W. Taylor, Painesville, O., with Lake County Public Health League

Alfred P. Upshur, M.D., New York, N. Y., Assoc. Medical Dir., Life Extension Inst.

William F. Van Buskirk, Ann Arbor, Mich. (Assoc.)

Prof. Martin Vogel, Dresden, Germany, Educational Dir., German Hygiene Museum (Assoc.)

Pearl E. Wilson, Oklahoma City, Okla., Dir., Dental Health Education, State Dept. of Health

Public Health Nursing Section

Mary Andris, Portsmouth, O., County Health Nurse

Alice C. Baker, Pittsburg, Calif., Health Center Nurse

Louise C. Buhrer, R.N., Dillon, Mont., Supt. of Barrett Hospital

Mary G. Close, R.N., Las Cruces, New Mex. (Assoc.)

Charlotte Eaton, Hartford, Conn., Educational Dir. of Hartford Visiting Nurse Assn.

Sarah G. Emery, Port Worth, Tex., School Nurse

Frances Gayle, San Antonio, Tex., Public Health Nurse

Charlotte M. Hanson, Rochester, Minn., School Nurse

Robina Kneebone, Richmond, Va., Prof. Public Health Nursing, College of William and Mary

Elizabeth E. Kuntze, Berkeley, Calif. (Assoc.)

Carrie E. Lewis, Cleveland, O., Asst. Dir. of Nurses, Dept. of Health

Anne Martin, Big Spring, Tex. (Assoc.)

Mary A. McGarry, R.N., Syracuse, N. Y., District State Supv. Nurse

Celia Moore, R.N., Austin, Tex., State Itinerant Nurse

Irene A. Nichter, Lancaster, N. Y., Public Health Nurse

Eileen Patenaude, R.N., Green Bay, Wis., City Nurse

Marguerite A. Reverdy, R.N., New Cumberland, W. Va., County Nurse

Dora Roberts, Big Spring, Tex. (Assoc.)

Catherine Sampson, Catonsville, Md., Visiting Nurse, Johns Hopkins Hospital

Mrs. M. R. Showalter, Big Spring, Tex., Public Health Nurse, Howard County

Katherine F. Small, Paso Robles, Calif., Public Health Nurse
E. Winnifrede Smith, Geneseo, N. Y., Public Health Nurse
Elizabeth F. Spearman, R.N., Asheville, N. C., Supervisor, Mission Hospital
Esther Spicer, Baltimore, Md., Director, Prenatal and Obstetrical Work, Johns Hopkins Hospital
Eleanor Stockton, San Francisco, Calif., Director, Bur. of Field Nursing, Dept. of Health
Lucile Stone, Uvalde, Tex. County Health Nurse
Mrs. Fox Stripling, Big Spring, Tex. (Assoc.)
Lona L. Trott, St. Louis, Mo., Asst. Director, Nursing Service, Midwestern Br. Amer. Red Cross
Helen O. Van Orden, Alameda, Calif., Nurse Inspector, High School
Sophia D. Weisbard, San Luis Obispo, Calif., School Nurse
Grace L. Wiley, R.N., Mayetta, Kans., Field Nurse, Indian Service
Sadie E. Wolf, Ann Arbor, Mich. (Assoc.)
Mary L. Wright, Detroit, Mich., Asst. Dir., Visiting Nurse Assn.

Epidemiology Section

Arnold S. Anderson, M.D., St. Paul, Minn., Exec. Secy., Tuberculosis Director, State Board of Control
Michael J. Bent, Nashville, Tenn., Dir., Dept. of Bacteriology, Meharry Medical College
Travis P. Burroughs, M.D., Olean, N. Y., Deputy County Commr. of Health
Walter Clarke, New York, N. Y., Director, Medical Measures, American Social Hygiene Assn.
Margaret C. Herrick, Augusta, Me., Asst. to Dir., Div. of Com. Dis., State Dept. of Health
Austin U. Simpson, M.D., Seattle, Wash., Epidemiologist, State Dept. of Health
Richard Slee, M.D., White Plains, N. Y., Deputy Commissioner, Dept. of Health
Vivian A. Van Volkenburgh, M.D., Baltimore, Md., Associate, Dept. of Epid., Johns Hopkins Univ.

Unaffiliated

J. L. Carpenter, Greenville, S. C., Member, Executive Committee, State Board of Health
Wyman C. C. Cole, M.D., Detroit, Mich. (Assoc.)
Charles R. Hoover, Middletown, Conn., Research in Trade Waste Disposal
Alvin E. Keller, M.D., Nashville, Tenn., Asst. Prof. of Preventive Medicine, Vanderbilt Medical College
Daniel M. Molloy, M.D., Guatemala, C. A., Member, Field Staff, International Health Division, Rockefeller Foundation
Mrs. Lewis S. Thompson, Red Bank, N. J. (Assoc.)

DECEASED MEMBERS

Dr. John A. Ceconi, Dorchester, Mass., Elected Member 1922, Fellow 1928
Elliot H. Gage, Chicago, Ill., Elected Member 1917, Fellow 1923
Abilio De Castro, M.D., Brazil, S. A., Elected Member 1926 (Assoc.)

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

CONVALESCENT SERUM CLINIC

EDGAR E. MARTMER, M. D.

Detroit Department of Health, Detroit, Mich.

THE Convalescent Serum Clinic of the Detroit Department of Health was opened January 17, 1928, at the Herman Kiefer Hospital. Its purpose is to provide convalescent serums for passive immunization and therapeutic treatment of the acute communicable diseases.

The immediate emergency which led to its establishment was the measles epidemic of 1927 and 1928. This epidemic was rather severe, and since the only reliable method of preventing or modifying the disease is the use of human serum from convalescents, it was decided to attempt to provide the physicians of Detroit with sufficient serum to passively immunize infants and children under 4 years of age who had not had a previous attack, and who had been in direct contact with a case of measles.

With the success of the work with measles serum, the activities of the clinic were extended to include convalescent serums for scarlet fever, mumps, chicken pox, whooping cough, and poliomyelitis. Small amounts of serum were also collected for experimental use in the treatment and prophylaxis of influenza, meningococcic meningitis and pneumonia.

With the announcement of the availability of these serums there has been an increase in the demand for them, which has resulted in a rapid growth of the clinic. During the first year 327 donors were used. In 1929 the number rose to 458, while in the first half of 1930 there were 460 donors, which will make the total for the year over 900.

There has been a marked increase in the demand for convalescent scarlet fever serum, there having been produced in 1928, 8,212 c.c of scarlet fever serum; in 1929, 29,925 c.c. At the present rate we will produce approximately 48,000 c.c. in 1930. Table I shows the amounts of serum we have produced and distributed up to July 1, 1930.

TABLE I

Disease	No. of Donors	C.c. of Blood	C.c. of Serum	Total Doses
Scarlet Fever	566	121,400	59,137	10.887
Measles	162	73,920	40,129	4,912
Whooping Cough	72	16,265	7,987	624
Chicken-pox	74	15,885	8,855	564
Poliomyelitis	63	13,360	6,697	191
Normal	62	11,950	5,608	181
Mumps	39	6,305	3,490	391
Influenza	8	1,900	910	10
Meningococcic Carriers	8	1,735	825	
Meningococcic Meningitis	4	980	460	
Total	1246	271,865	133,198	17,760

It is not the purpose of this paper to show the value of convalescent blood serums in the prevention and treatment of the acute communicable diseases, but rather to show that it is possible to ob-

tain a large number of donors and a sufficiency to make the supply of convalescent serums available to all who require it.

The personnel of the clinic consists of 1 part-time physician, 2 full-time nurses, and 1 technician.

The first step in the operating and maintaining of a clinic depends upon having available the names and addresses of all cases of communicable disease, and this is made possible by the use of the files of the Communicable Disease Division of the Department of Health. As every case of communicable disease is released from quarantine, a slip is sent by the registrar to the Communicable Disease Division, notifying them of the release of the case. This information is in turn forwarded to the Serum Clinic. The names are filed and used as necessary. A letter is sent explaining the work of the Serum Clinic, and asking recovered cases, if they are physically fit, to write, telephone or make a personal call to discuss the question of giving serum. As a report is received, a definite appointment is made, and donors are requested not to take any food in any form for at least 3 hours preceding their visit to the clinic. They are assured at this time that sufficient blood will not be taken to inconvenience them in any way.

When they arrive at the clinic, history is taken, both personal and communicable disease. The personal history includes the name, address, telephone number, age, sex, weight, and color, also the date of recovery from the communicable disease for which they are donating blood, and the name of the physician who attended at the time of illness.

The blood is taken by introducing a 16 gauge sterile needle into the vein of the forearm, and from 100–400 c.c. of blood is drawn into sterile flasks. After the blood is taken, the donors are paid $10 in cash at once, and asked if they are willing to return. If they are willing, and the blood is satisfactory, a form letter is mailed to them in 2 weeks, and once a month thereafter for one year, making further appointments.

The blood which has been withdrawn is immediately placed in the icebox, and the following morning the flasks are centrifuged and the clear serum withdrawn. A sample of the serum is tested by the Kahn and Wassermann tests, and, if the reports are negative, this serum is then pooled with several other quantities of the same type of serum. Carbolic acid in a proportion of 0.4 per cent is added, and the serum is then tested for sterility.

A second sample is typed and the results recorded so that donors of serums for various communicable diseases are available according to type for transfusion purposes.

After being proved sterile, it is bottled in containers in quantities of 7.5 c.c. for prophylactic use, and 30 c.c. for therapeutic use, these amounts having been found to be the most satisfactory. The serum is then incubated for a week and again tested for sterility. If the packages are sterile, they are labeled and given a batch number, so that we are able to trace any given dose of serum. Samples are also kept for future study.

When a physician desires convalescent serum for either prophylactic or therapeutic use, he can obtain it at the Department of Health, the only requirement being that he furnish a report as to its value. The value of the serum has been reported by other members of this department, and further studies are under way.[1,2]

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2. Gordon, J. E., and Meader, F. M. The Period of Infectivity and Serum Prevention of Chickenpox, *J. A. M. A.*, 93: 2013–2015 (Dec. 28), 1929.

Domestic Employees in Newark—In Newark an ordinance took effect September 1, 1930, requiring that all domestic servants should have a physical examination either at the hands of a licensed physician or, without charge, by the Department of Health. The Health Department issues a certificate which is good for a period of 6 months, indicating that the domestic has been found free from tuberculosis and any other contagious or communicable disease. The regulations of the department require that all restaurant and kitchen employees, where food is cooked or served, must come to the Health Department Clinic for examination. An exception is made for a few large department stores and insurance companies where complete clinic facilities are available. All other food handlers, including: grocers, milk dealers, confectioners, bakers, butchers, soda dispensers, etc., and domestic employees may be examined by private physicians or at the Health Department clinics. It is stated that 90 per cent of these examinations are made at the clinics. When made by a private physician, the examination must be reported on blanks provided by the Department of Health. --C. V. Craster, Health Officer.

Clinical Conferences on Communicable Diseases—In the belief that ultimate progress in preventive medicine must depend on the degree of interest evidenced by the practicing physician, the Detroit Department of Health for the past 2 years has conducted its toxin-antitoxin campaign in direct collaboration with the private physician, rather than by means of public health clinics. The success of this project, in stimulating general interest in preventive medicine among the profession, was so gratifying that the idea has been further extended. Aside from accomplishing specific prophylaxis, the most important method by which the private physician can aid in limiting communicable disease consists in early diagnosis of actual infections which arise in his practice. The number of contacts is thereby limited and early treatment favors a lower case fatality.

The contact of the Department of Health with the medical profession has largely been by means of lectures, literature and general educational measures. In an attempt to reach the physician more intimately, and to offer something of more direct relation to the practical problems of his profession, the Department of Health and the Public Health Committee of the Wayne County Medical Society last year inaugurated a series of clinical conferences on communicable diseases. Practical problems in early diagnosis and demonstration of preventive and therapeutic measures were presented by means of case histories and the demonstration of patients. These conferences were so successful, both from the standpoint of attendance and interest, that the committee arranged for a second series which started October 29, 1930. In response to numerous requests this activity has been extended to include all physicians in the southeastern part of the state and all others in Michigan who may find it possible to attend. Health officers are particularly invited to these clinics.—Detroit Department of Health.

Epidemic Jaundice—During the month of October, 1929, the attention of the Health Officer and School Physician was drawn to the appearance of jaundice among the school children. Eight cases were found during the month, and on October 24, 1929, two specimens of urine were taken to Dr. Flexner, at the Rockefeller Institute for Medical Research. On October 25, 1929, Dr. Flexner reported finding moving spirochetae under the dark field microscope and that guinea pigs had been inoculated. On November 4,

1929, Dr. Flexner reported that the guinea pigs had died and showed the lesions and symptoms of infection with Leptospira ictohemorrhagiae, and that the carrier of the disease was the rat. Sporadic cases occurred during the winter months to the middle of April, 1930, amounting to 17 cases.

Clinically the symptoms noted were malaise and nausea, followed by vomiting and jaundice. The amount of jaundice varied in intensity in different individuals. The temperatures were low in most all cases and the disease lasted about 2 weeks.

The first 4 cases occurred about a half a mile from the Town Dump and in a general way the remainder of the cases spread along the water course near which the dump is situated.—Lawrence E. Poole, M.D., Fairfield, Conn.

LABORATORY

C. C. YOUNG, D. P. H.

MANGANESE IN RIVER WATER AND ITS REMOVAL

PERKINS BOYNTON, F. A. P. H. A.

Chemist in Charge, Clarksburg Water Board, Clarksburg, W. Va.

DURING the last 10 years or so, in the section of the country including West Virginia and other soft-coal producing states, manganese has been found in increasing quantities in the river waters. Previously it was not a problem in water purification nor was it recognized apart from the other contents of a water removed by filtration or other treatment.

The writer left West Virginia in 1917, after operating the Clarksburg Filter Plant for 5 years, beginning about a year after the plant was started in 1910. In these 6 or 7 years, the sand, originally a nearly white bar sand, had grown a little darker, as was to be expected from the passage of coagulated, settled water. Upon his return to Clarksburg in 1924, he found that the filter sand was black in the beds, and of a dark brown color when dry. Soon after a brownish black deposit was discovered on the bowl of the Wallace & Tiernan Suction Type Chlorinator, which had been installed to feed the filtered water within the last 3 years previous to that time. Chemical examination showed that the discoloration in the filter sand and the deposit in the chlorinator was due to manganese. Examination of the river and treated waters proved the presence of manganese in both, to the extent of 0.1–0.2 part per million. This amount was sufficient to darken the sand through continuous operation, that in the filtered water evidently being taken up from the sand grains.

The treatment at the Clarksburg Plant now consists of the addition of alum and lime, the latter fed to the raw water to increase alkalinity and to the filtered water to remove free CO_2. Softening is not usually attempted.

During the present drought, when the water was considerably harder than usual, it was decided to use up a supply of soda ash that was on hand. Although the plant is not equipped to soften water, 50 per cent of hardening constituents was removed—all sulphates,

alkalinity running nearly nil.

Frequent tests for manganese in both the raw and treated water began to show that while the manganese in the river water was increasing in the filtered water it had nearly disappeared. The run with soda ash was soon over, and as the continued drought caused the hardness and also the free CO_2 to increase, hydrated lime was added beyond the amount necessary to make up the deficiency in alkalinity or to a phenolphthalein reaction of 7–10 (pH 8.3), with the result that, whereas the manganese in the river water has now reached 2.0–2.4 parts, that in the water sent to the city is 0.0–0.1 part. This high manganese content is accompanied by 300 parts hardness, 30 parts free CO_2 and alkalinity 0.0 to slightly acid. Iron is only 0.1 part.

The renewal of all sand and gravel in the 8 beds is contemplated this fall and it will be interesting to note the appearance of the sand from time to time and to check by analysis for manganese, if the above mentioned scheme of operation is followed at such times as the manganese is high or the necessary coagulation schedule will permit.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Suicide Among Negroes in the United States—Although negroes have a homicide death rate over eight times that of the white population, they comparatively rarely take their own lives. In 1927, the latest year for which general population statistics are available, there were only 373 suicides among negroes out of a total of 14,096 in the Registration States of the United States. This number gives a death rate of 4.1 per 100,000 population for negroes as compared with a rate of 14.1 for the whites. In other words, almost three and one-half times as many whites as negroes commit suicide.

But although relatively few negroes commit suicide, it is interesting to find that among the industrial policy holders of the Metropolitan Life Insurance Company the divergence between the suicide rates for white and colored people is not nearly so great as it is in the country at large. In 1927, the standardized death rates were respectively 11.1 and 6.2 per 100,000 among the white and colored policy holders. The white rate was, in short, less than double the colored. Not only was the rate for insured white persons lower than in the general population, but the rate for insured negroes was distinctly higher.

At first sight, it appears rather disconcerting that 156 of the 373 negro suicides, or 42 per cent of the total, were in the insured group, although they compose only about one-quarter of the negro population of the country. But, upon analysis, we find two very good reasons for this discrepancy.

First, the negro policy holders of the Metropolitan are almost exclusively city dwellers. It is well known that throughout the world suicide is much more frequent in urban centers than in rural areas. Among the negroes as well as the whites, we find the same

differential in favor of those living in rural districts. In the Registration States of the United States in 1927, the urban rate was 9.6 per 100,000 for the colored as contrasted with 2.4 in the country districts. Nowhere is there more conclusive evidence of the favorable factors in rural living as regards suicide than in our southern states, for we find that suicide death rates for southern states, as a whole, are very low; whereas for the white population of southern cities they are strikingly high.

The second item which explains the higher suicide rates of negro policy holders is that those insured in the Metropolitan reside, for the most part, in the cities of the North. In fact, over two-thirds of the insured are found in northern cities. It is not surprising to find, therefore, that of the 156 suicides in the year, 118 or 75 per cent took place in northern cities. There is clearly a marked difference in status between negroes in the North and in the South. The unfavorable health situation of those who have migrated from the rural areas of the South to the great industrial centers of the North has been pointed out. Suicide rates would likewise seem to be affected by the disorganization which accompanies such movements of population. Thus, among negro industrial policy holders, in addition to the greater strain which urban life exerts, there is added the adverse effect on health and stability of a change from the South to the North. Our studies point to the conclusion that the mortality of the negro is better in the South and especially better in the rural districts of the southern states. This analysis of suicide frequency only adds to the strength of that conviction and explains why the suicide rate for insured negroes is so much higher than for the negro population as a whole.—Met. Life Ins. Co. *Stat. Bull.*, 11: 4–5 (Sept.), 1930.

MARRIAGE AND DIVORCE, 1929

Alabama—There were 29,430 marriages performed in Alabama during the year 1929, as compared with 28,853 in 1928, representing an increase of 577 or 2.0 per cent. In 1916, there were 25,453 marriages performed.

During the year 1929 there were 3,589 divorces granted in the state, as compared with 3,817 in 1928, representing a decrease of 228 or 6.0 per cent. In 1916 there were 2,265 divorces granted. There were 10 marriages annulled in 1929 as compared with 11 in 1928.

The number of marriages per 1,000 of the population was 11.3 in 1929, as against 11.2 in 1928; and the number of divorces per 1,000 of the population was 1.38 in 1929, as against 1.48 in 1928.

Oklahoma—Oklahoma reported an increase of 25.7 per cent in the number of marriages in 1929 over 1928, the actual number performed being 35,789 and 28,472 respectively.

During the year 1929 there were 8,252 divorces granted in the state, as compared with 7,762 in 1928, representing an increase of 490 or 6.3 per cent. In 1916, there were 3,693 divorces granted. There were 164 marriages annulled in 1929, as compared with 172 in 1928.

The number of marriages per 1,000 of the population was 14.7 in 1929, as against 11.7 in 1928; and the number of divorces per 1,000 of the population was 3.40 in 1929, as against 3.20 in 1928.

Kentucky—There were 30,474 marriages performed in Kentucky during the year 1929, as compared with 29,065 in 1928, representing an increase of 1,409 or 4.8 per cent.

During the year 1929 there were 4,592 divorces granted in the state, as compared with 4,610 in 1928, representing a decrease of 18 or 0.4 per cent. There were 8 marriages annulled in 1929, as compared with 13 in 1928.

The number of marriages per 1,000 of the population was 11.7 in 1929, as against 11.2 in 1928; and the number of divorces per 1,000 of the population was 1.76 in 1929, as against 1.78 in 1928.

Kansas—There was an increase of 6.9 per cent in the number of marriages performed in Kansas during 1929 over 1928; the actual numbers were 21,041 in 1929 and 19,679 in 1928.

During 1929, 4,127 divorces were granted, representing an increase of 1.1 per cent over 1928. There were 18 marriages annulled in 1929 and 28 in 1928.

The marriage rate per 1,000 population in 1929 was 11.2 against 10.6 in 1928; the number of divorces per 1,000 population was 2.20 in 1929, against 2.19 in 1928.

Mississippi—The Department of Commerce announces that, according to the returns received, there were 31,495 marriages performed in Mississippi during the year 1929, as compared with 30,263 in 1928, representing an increase of 1,232 or 4.1 per cent.

During the year 1929 there were 3,159 divorces granted in the state, as compared with 3,007 in 1928, representing an increase of 152 or 5.1 per cent. There were 7 marriages annulled in 1929, as compared with 3 in 1928.

The number of marriages in Mississippi per 1,000 of the population was 17.6 in 1929, as against 16.9 in 1928, and the number of divorces per 1,000 of the population was 1.76 in 1929, as against 1.68 in 1928.—U. S. Census Bureau, Preliminary Report.

Air Travel Fatality Statistics—The Actuarial Society of America has published a report on aviation statistics which shows that travel by airplane is becoming safer, because the death rate among passengers is gradually decreasing. The report points out that there is not so much danger of accidents to passengers riding with pilots with 400 or more hours of experience in the air as with pilots with less than such a number of hours' experience.

The death rate among pilots holding a license of the transport type was 79 per 1,000 for aviators having less than 400 hours of flying while the rate was only 29 per 1,000, or 63 per cent less, among those with at least 400 hours in the air.

While the passenger death rate on railroads in 1929 was approximately 1 per 300,000,000 passenger miles, the fatality rate in airway travel was about 1 per 1,250,000 passenger miles, or more than 200 times as hazardous as railway passenger service. The death rate of aviation passengers from January, 1927, through March, 1930, was 1 per 5,000 persons carried on scheduled air lines.

The number of miles covered by aircraft has an important bearing on the death rate among passengers. The records showed that in non-scheduled commercial flying the passenger fatality rate was about 2 per 100,000 persons carried, or about one-tenth of the mortality experienced in scheduled flying.

The experience of the U. S. Army and Navy pilots showed a death rate much lower for the year ending June 30, 1929, than did the best class of commercial aviators. The death rate of commissioned airplane pilots in the Army was 8 per 1,000 and in the Navy 10 per 1,000. The annual average for the last three years was 13 per 1,000 in the Army and 21 in the Navy.—*Canad. Insurance*, 35: 4 (Aug. 26), 1930.

MORTALITY STATISTICS, 1929

Idaho—The Department of Commerce announces that there were 4,075 deaths in Idaho during 1929 as compared with 4,177 in 1928.

The comparatively few causes of death which showed noticeable increases in 1929 as compared with 1928 were

meningococcus meningitis, which caused more than twice as many deaths, measles, cancer, diseases of heart, and cerebral hemorrhage and softening.

The principal decrease is in deaths from influenza (295 to 163), which alone more than offsets the decrease from all causes; other diseases which caused fewer deaths in 1929 than in 1928 were tuberculosis all forms, pneumonia all forms, diarrhea and enteritis under 2 years, and nephritis. Deaths from suicide and homicide also decreased considerably in 1929, and among accidental causes there was a fair decline in deaths from automobile accidents.

Colorado—There were 12,874 deaths in Colorado during 1929 as compared with 14,077 in 1928.

There was a decrease in the number of deaths in 1929 as compared with 1928 due principally to the lesser number of deaths from influenza and pneumonia. In addition, decreases were reported in the following causes: measles, scarlet fever, whooping cough, diabetes mellitus, diseases of the heart, and nephritis. The number of deaths from tuberculosis (all forms) has decreased continuously from 1926 to 1929.

Among the causes of deaths for which increases are reported are typhoid and paratyphoid fever, and diarrhea and enteritis of children. Deaths from homicide increased from 61 in 1928 to 90 in 1929.

The increase in the number of deaths due to accidental and unspecified external causes was due principally to automobile accidents, though increases were also reported in the number of drownings, accidental falls, mine accidents, railroad and street car accidents.

South Carolina—South Carolina has reported 23,053 deaths during 1929 as compared with 24,427 in 1928.

The most pronounced decrease in deaths in 1929 as compared with 1928 was for measles (from 299 to 4), and next in importance was that from typhoid and paratyphoid fever, which also showed a remarkable and steady decline from 1926; other notable decreases from 1928 were from dysentery, diarrhea and enteritis under 2 years, pneumonia all forms, tuberculosis all forms, cancer, and congenital malformations and diseases of early infancy; pellagra, also, showed a slight decline, although it ranked among the highest eight causes of death in 1929, when there were 943 deaths as compared with 563 in 1926.

Generally considered, the increases in deaths were comparatively slight, and were shown most noticeably for whooping cough, influenza, diseases of the heart, and cirrhosis of the liver.

Deaths from accidental causes increased from 1,095 in 1928 to 1,161 in 1929, but this increase was much more than balanced by the increase in deaths from automobile accidents (from 251 to 350).

North Carolina—There were 36,919 deaths in North Carolina during 1929 as compared with 36,150 in 1928.

Practically all of the diseases which caused increases in the number of deaths in 1929 were also responsible for a greater mortality in the two years preceding. The causes for which this is true are scarlet fever, whooping cough, diphtheria, influenza, cancer and other malignant tumors, pellagra, diabetes mellitus, cerebral hemorrhage and softening, diseases of the heart, bronchitis, hernia, intestinal obstruction, nephritis, puerperal causes other than puerperal septicemia, suicide, homicide, and all kinds of accidents.

These continuous increases to some extent were offset by continuous decreases for the last 3 years in typhoid and paratyphoid fever, smallpox, measles, cirrhosis of the liver, and railroad accidents.

Most notable decreases from 1928 to 1929 appeared for measles, from 515

deaths to 20, and for diarrhea and enteritis, under 2 years, from 1,284 to 973.

Increases in deaths from 1928 were shown for whooping cough, tuberculosis all forms, diseases of the heart, nephritis, cerebral hemorrhage and softening, and influenza; this last cause increased from 1,567 to 2,304. Suicide and homicide also caused more deaths in 1929 than in 1928.

Deaths from accidents decreased from 1928 to 1929, the greatest reduction in number showing for burns and railroad accidents. The largest increases in deaths were those from shooting, falls, and automobile accidents, the last having mounted steadily and noticeably since 1926.

West Virginia—There were 18,128 deaths in West Virginia during 1929 as compared with 17,507 in 1928.

Marked increases are for whooping cough, which almost quadrupled the deaths of 1929 from this cause over 1928, and influenza and dysentery, which practically doubled their mortality. These three causes were responsible primarily for the increase in the total deaths although less marked increases are shown for measles, diseases of the heart, pneumonia (all forms), and diarrhea and enteritis (under 2 years).

Decreases even though general were notable in scarlet fever, acute anterior poliomyelitis, tuberculosis (all forms), cancer and other malignant tumors, diabetes mellitus, nephritis, and homicide.

Among accidental deaths, decreases in 1929 were shown for drowning and shooting but these were nearly balanced by the increase in deaths from automobile accidents.—U. S. Department of Commerce. Bureau of the Census. *Provisional Summary: 1929.*

LARGE DEMAND FOR FREE SERVICE IN HOSPITALS

NON-MUNICIPAL hospitals, dependent on voluntary contributions for support in order to provide free care for the sick poor, are having one of the hardest seasons in many years. Homer Wickenden, General Director of the United Hospital Fund, comprising 57 such hospitals in New York and Brooklyn, states that already a 10 per cent increase in the demand for free service has been noted in the hospitals, and that on the average a patient enters one of the 57 United Hospitals or its outpatient department every 30 seconds, and every 12 minutes an ambulance answers an emergency call. This demand for free treatment is attributed largely to the current business depression, the lack of employment, the exhaustion of savings accounts, and inability to pay even in part for hospital care.

OUTDOOR RELIEF AGENCIES IN NEW YORK CITY

THE people of New York City contribute nearly $14,000,000 a year for the work of their "outdoor relief" agencies—organizations giving assistance to persons in their own homes. This is disclosed by a study of the income and expenditure of all local welfare agencies over the 17 years of 1910 through 1926 just completed by the Welfare Council of New York City.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

Iron Hydroxide Prevents Mosquito Breeding—Observations by G. L. R. Hancock, in Uganda, record the antagonistic effect of flocculent ferric hydroxide upon mosquito breeding and discover other deterrents of the Anophelines. Senior-White showed that the presence of an oily scum and flocculent masses of iron hydroxide are associated with the absence of Anopheline larvae.

Natural waters were tested with the reagent of equal parts of concentrated hydrochloric acid and potassium ferrocyanide. A swamp showing between 10 and 20 p.p.m. of iron hydroxide (calculated as Fe^3) gave negative Anopheline records. A tin of red soil was put into a water hole containing a large number of *A. gambiae*. The red soil raised the iron content of the well from 5 to 15 p.p.m., two larvae were found; a later observation, when the water showed 10 p.p.m. of ferric iron, revealed no mosquito larvae.

Another swamp containing flocculent iron hydroxide harbored Culex but no Anophelines. In a third swamp, not dominated by the sedgy plants Cyperaceae but containing iron hydroxide, only one Anopheline larva was found.

The observations suggest that a high concentration of iron, or some factor with it, is unsuitable for Anophelines, and indicate the possibility of controlling mosquito breeding by the addition of iron, perhaps in the form of red soils containing iron. The action of iron on plankton will obviously require study.

An oily scum which showed few bacteria proved to be composed chiefly of iron hydroxide. There are other iridescent oily scums of similar appearance associated with various organisms and inorganic substances. The influence of the flora and its correlation with the composition of the soil and water, as well as the rôle of phytoplankton, will need much study. Most of the swamps in which a large species of Cyperaceae is dominant appear to contain much flocculent red iron hydroxide precipitate and have yielded no Anophelines. J. Omer Cooper is of the opinion that the female mosquito does not exercise a great amount of discrimination but that the larvae fail to survive more from biological than mineral factors.

These observations suggest that mosquitoes may not be found breeding in pools in red clay or other iron-bearing soils, and that such earths added to ponds in gray loams may prevent the development of mosquito larvae. American investigations are needed.

Anopheline larvae occurred only rarely in association with shrimps along the lake shore. G. E. Hutchison stated that in South Africa places suitable for mosquitoes are often unsuitable for predacious water bugs, represented in America by such insects as the waterboatman, Notonectidae. Hancock observed that the small fish attacked the mosquito larvae only when the latter were in motion.—G. L. R. Hancock. *Bul. de la Soc. Royal Entomologique d'Egypte*, 1930. Abstr. H. B. Wood.

Two Years' Study and Practical Use of Crank Case Waste Oil as a Mosquito Larvicide—An account is given of experiments and field observations showing that crank case oil can be

efficiently used against mosquito larvae. The oil almost always requires straining, and apparatus for doing this is described. It does not in itself spread on water, but may be made to do so by the addition of a spreader such as tar acid (containing 25 per cent cresylic acid) or by adjusting the specific gravity of the oil to 32 or 34° Be. by the addition of light petroleum distillates.

Of these, one of the most satisfactory was found to be a waste product obtained from "varnolene," which is used as a solvent in the varnish industry, etc. It is a low boiling petroleum distillate and possesses the following specifications: Be. gravity 46.8°; flash point 96° F. closed cup; 160° F. open cup; boiling range 300–417° F. Like tar acid, it is itself highly toxic to mosquito larvae, whereas crank case oil is not. The lasting quality of the oil mixture is from 2 to 4 weeks, or twice as long as that of fuel oil, and the cost is about half that of the latter.

A method of calculating the amounts of the two oils to be mixed that are required to obtain a mixture of a given specific gravity is described.—J. P. Peterson and J. M. Ginsburg. *Proc. 16th Ann. Mtg. New Jersey Mosquito Exterm. Assn.*, Atlantic City, 1929, pp. 92–101. (From *Review of Applied Entomology*, Dec. 1929.) From *Pub. Health Eng. Abstr.*, Apr. 5, 1930. Abstr. V. M. Ehlers.

Deratization of Milan—It was decided that on a given day the deratization program should be undertaken simultaneously by the owners of buildings throughout the city.

Zinc phosphate (30 per cent solution in oil) was used as the active ingredient for the deratization of sewers, canals, public buildings, dumps, etc. For the deratization of dwellings, use was made of products which are less toxic to human beings (squill, adonis vernalis, chelidonium and cynoglossum). A solution of these active ingredients was furnished by the municipality at cost (5 lire for 50 baits).

On receiving the toxic solution, the householders were given a receipt on which printed requests were made for information regarding the number of baits devoured, the number of dead rats collected, and the presence of living rats following deratization. These cards were to be returned to (sanitary) inspectors.

Proprietors of factories, hotels, stores, etc., were left free to select their own measures of deratization but were required to report on the methods used.

The deratization was declared obligatory in all buildings including those where rats had never been observed. There are 22,170 buildings in Milan, covering a (estimated) surface of 6,000,000 square meters (exclusive of courtyards, gardens, etc.). It is estimated that one bait should be placed for each 2 square meters of surface. Actually, provision was made for the preparation of 4,500,000 baits.

It is estimated that only 2 per cent of the rats killed were found on the surface of the ground, and that 20 per cent of the baits set out were devoured. On this basis the number of rats killed was several hundred thousand.

The campaign is being continued, efforts now being directed toward the rat-proofing of buildings. — Georges Tron. *Rev. Hyg. Med. Prev.*, 51: 745–9. From *Pub. Health Eng. Abstr.*, Apr. 5, 1930. Abstr. Emery J. Theriault.

Digestion of Activated Sludge—The city of Pomona has a very ingenious way of conserving the cost of sewage treatment. A 20-year contract was made with the Northside Water Company of Walnut, Calif., to use the effluent from the activated sludge plant. The company agreed to pay one-half cent per inch-hour from October to

April, and one cent per hour for the remaining 6 months. All of this water is subsequently sold for irrigation purposes. In addition to this revenue Pomona charges two small cities for treating their sewage, sells water from a paper mill, and leases the sewer farm. The revenue comes from the following sources:

Sale of effluent (disposal plant)	$4,669
Sale of sludge	414
Claremont, LaVerne income for sewage treatment	1,389
Sale of paper mill water	1,652
Lease of sewer farm	1,500
	$9,624

A study was made of pumping sludge from the activated sludge plant into the digestion chamber of the Imhoff tank. Experience showed this was not a satisfactory method. Sludge came up in the flowing-through chambers, completely destroying the action of the Imhoff tank. Greatly improved results were obtained by diluting the activated sludge with raw sewage, influent, to the Imhoff tank.

The author of this article mainly discusses costs of operation, and makes a plea for conservation of sewage effluent for irrigation purposes.—F. H. Froehde. *Calif. Sewage Works J.*, 2: 1, 1929, pp. 82–87. From *Pub. Health Eng. Abstr.*, Apr. 12, 1930. Abstr. M. S. Foreman.

Chlorination of Water—A skillful and careful review of the existing knowledge of the practice of water purification, both in America and Europe, and of its hygienic significance. This is supplemented by the results of well planned sets of experiments by the staffs of the Central Public Health Laboratory and of the Water Supply Bureau on the dosage and period of contact necessary for disinfection with chlorine and on the taste resulting from various chlorine dosages applied to a typical dune water. The taste experiments show how widely different individuals, and even the same individual at different times, may vary in capacity to detect low chlorine dosages (less than 0.1 p.p.m.). Applications to swimming pools and sewage are included. The references to the literature are valuable.—A. Masink. *Government* (Holland) *Water Supply Bu. Bull. No. 5*, Apr., 1924. From *Pub. Health Eng. Abstr.*, May 3, 1930. Abstr. Frank Hannan.

Experimental Sewage Treatment Work in Europe—In Europe, and particularly in Germany, a great deal of experimental work on sewage treatment is in progress. Activated sludge treatment using the submerged contact aerators, with mechanical paddles in combination with compressed air, is being tried by many cities. Phases of the work receiving particular attention are: The rotation of sludge to hasten sludge digestion and increase gas production; heating the digesting sludge and the collection of gases. In Great Britain a great deal of work is being done on reaeration of activated sludge. The city of Paris is carrying on experimental work to determine the type of activated sludge plant to be constructed in the future.

Brief descriptions are given of eight interesting plants in Germany, three in Great Britain and one in France. The city of Berlin is constructing a 48 m.g.d. plant which will be operated on a large scale experimental basis.—G. P. Edwards. *Water Works & Sewer.*, 77, 3 (Mar.), 1930, pp. 89–92. From *Pub. Health Eng. Abstr.*, May 10, 1930. Abstr. J. B. Harrington.

Can Tastes and Odors be Removed from Highly Polluted Waters?—Data are presented to show that highly polluted water, i.e., 10 to 20 thousand bacteria per c.c., can be made sterile and entirely free from ob-

jectionable tastes at an estimate of from $2.00 to $5.00 per million gallons, exclusive of the cost of clarification.

Baylis believes that the use of ammonia and potassium permanganate for taste prevention is limited. Activated carbon is recommended for dechlorination and taste removal. The author's opinion is that super-chlorination followed by dechlorination with active carbon will produce the ideal testing water.—John R. Baylis. *Water Works Eng.*, 83, 4 (Feb. 12), 1930, pp. 227–228 and 236. From *Pub. Health Eng. Abstr.*, May 17, 1930. Abstr. A. C. Janzig.

A Recent Development in Lime Water Softening—This article describes a method of reducing carbonate hardness of water by lime softening to the theoretical or approximately to the theoretical limit. The process comprises adding to the water sufficient lime (CaO or $Ca.OH_2$), to combine with the free and half-bound carbon dioxide and to precipitate the magnesium hydroxide. Considerable lime (25 to 50 p.p.m.) in excess of that theoretically required to replace the magnesium must be added to convert the magnesium salts in the water to magnesium hydroxide. This leaves excess lime or caustic alkalinity in the water. After partial settling the excess lime is neutralized with carbon dioxide, then calcium carbonate, water softening sludge or other inert finely divided material is mixed with the water, after which settling or filtration takes place.

Laboratory experiments at the Columbus water softening and purification works indicate that results far more satisfactory than by the present method may be obtained, that the process will not require close supervision and that it will dispense with filtration difficulties and produce water with perfect chemical balance.—Charles P. Hoover. *Water Works & Sewer.*, 77, 3 (Mar.), 1930, pp. 103–104. From *Pub. Health Eng. Abstr.*, May 17, 1930. Abstr. J. B. Harrington.

Water Service in Holland—The present development of public water supplies in Holland is described with much valuable detail. The history is briefly outlined. The peculiarities of Holland, geologically and hydrologically, are explained. A few of the leading features of the paper follow, but those interested in the history and development of water service would do well to possess themselves of the original.

Of the 7.4 millions of inhabitants in January, 1926, 4.6 are served by 111 public water supplies, of which 80 (72 per cent) are publicly, and 31 (28 per cent) privately, owned. Of the 390 towns and communes served, 45 depend on surface sources, 110 on dune water, 228 on other ground water; the remaining 8 on combinations of these.

Nearly one-half of the country lies below the one metre contour line (above mean sea level at Amsterdam) and would of course be inundated at every high tide and by every flood in the rivers but for the dunes and dykes. A result of the peculiar conditions is that under all the low area except in the dune district water is encountered quite near the surface the salt in which exceeds 400 p.p.m., the limit for acceptable drinking water. Suitable drinking water is therefore scarce over large districts and rural public supplies have been established on a large scale. For instance, the Province of North Holland has 96 communes combined in one large undertaking; the Leeuwarden District supply embraces 12 communes; the S. Beveland Island supply, 24 communes; Tholen, 7; North-west Brabant, 24; South Lunburg, 18.

The 4.6 millions of persons supplied in 1925 used 150 million cu. m. of water; or an average of 89 litres per capita daily, a remarkably low figure.

The average consumption in the eight largest cities varied from 116 litres in Rotterdam to 53 in Haarlem.

The Amsterdam waterworks, the first in Holland, was constructed by English engineers in the year 1853. The Government Water Supply Bureau dates from 1913. The functions are described. On its files are the data of over 18,000 boreholes; over 30,000 soil samples; and about 8,500 water analyses. The composition of four typical waters, those of Rotterdam, Amsterdam, Utrecht and Heerenveen, are given with some detail. Marked improvement in the typhoid situation has resulted, notably in the fen districts, from the introduction of reliable drinking water.

The paper concludes with a discussion of water tower architecture, with illustrations of three desirable models. Two maps and seven graphs are given; also two figures illustrative of equilibrium conditions between fresh and salt ground water, first thoroughly worked out by Herzberg at Nordnervey in 1901, and later by Pennink, a former director of the Amsterdam waterworks. The original discovery of the important governing principle which generally goes by Herzberg's name is claimed by the Dutch military engineer Yhybon in the year 1889.—F. A. Liefrinck. *Wasserkraft u. Wasserwirthschaft*, 1927, Nos. 10, 11, 13, and 14. From *Pub. Health Eng. Abstr.*, May 3, 1930. Abstr. Frank Hannan.

Oil Exclusion and Removal—Exclusion of grease and light oils from sewer systems is a problem that has received very little consideration, and particularly from the designers of sewer systems. The grease problem at Los Angeles is quite a difficult one on account of the usual grease wastes, viz., preparation of foods and soapy effluent from laundries, these combined with the wastes from petroleum products, and the waste from a large number of garages.

It has been estimated that the one million people connected to the Los Angeles sewer system contribute 22 tons of grease per day. Practically all of this grease comes from individual house connections. Grease traps, properly maintained, have been suggested as a possible remedy to exclude grease.

Laundries are particularly objectionable because of the slow deposit of thin layers of oily material on the inner surface of pipes. This material accumulates and hardens and is difficult to remove. It has been observed that when laundries are located along large sewers little trouble is experienced, due to high dilutions.

Periodically, large quantities of black oil appear at the ocean screening plant. This oil is very detrimental to sewer screens, causing blinding, and can be removed only by steam. A city ordinance prohibits the wasting of oil in the sewer, but it is a difficult problem to enforce it.

A very dangerous situation is produced by the discharging of gasoline and other light oils into the sewer. Explosions have occurred recently where 30 manhole covers have been blown as high as 25 feet, due to explosive gases. The city is combating this problem by use of a gas detector.—F. A. Batty. *Calif. Sewage Works J.*, 2: 1, 1929, pp. 78–81. From *Pub. Health Eng. Abstr.*, Apr. 12, 1930. Abstr. M. S. Foreman.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., PH. D., AND LEONARD GREENBURG, M. D., PH. D.

The Health of the Worker of Today—After half-a-century's operation of the Public Health Service Acts the longevity of the race has increased 10 years (British Isles). The war came and instead of the results improving the condition of the working classes, the reverse has been the case. We find ourselves an overtaxed people, carrying an increasing burden of unemployment. We have not tackled the problem of regaining our lost markets diligently as have France and Belgium who now enjoy more prosperity and less unemployment.

The Controller of the Insurance Department of the Ministry of Health, Sir Walter Kinnear, reports that in a group of 500,000 insured persons he found, on comparing the experience of 1927 with the year of 1921, that in 1927 the claims of male members had risen by 41 per cent, those of unmarried women by 60, and those of married women by 106 per cent. In 1921, 14 out of every 100 men claimed sickness benefit; in 1927 the proportion had risen to 23. Among unmarried women the respective proportions were 12 and 21, and among married women 19 and 38. One hardly sees why, with all the efforts which have been made to improve the health of the community, claims of illness should have increased by 60 to 100 per cent within the space of 6 years. It is a fact also that the claims are out of all proportion to the increase in unemployment. Alderman H. J. Blakeway also states that within the last 30 years the average duration of sickness has increased from 16½ days to 28, and this without there being any marked percentage increase in the number of claimants. Of 2,260 cases submitted to the Medical Referees under the National Insurance Act, 1,034 were at once cleared off the funds of the society. This circumstance of itself suggests the necessity of the exercise of greater care in furnishing and repeating medical certificates of unfitness.

The author next discusses the apparent increase of disability in various industries such as cotton weaving, coal mining, cutlery, etc. Among coal miners nystagmus has considerably increased in the last three decades. Since it has now been found that the malady attacks men working in brightly illuminated mines, there is clearly something more required to cause it than defective illumination, as proclaimed by the late Professor Snell, of Sheffield. Dr. Robson of Cardiff regarded carbon monoxide as the cause, but several analyses have shown this gas to be absent. It is now suggested that it might be of microbic origin. It is interesting to note that 25 per cent of the miners affected with nystagmus do not know that they are the subjects of it.

Formerly a high death rate of comparatively young men occurred in the Sheffield cutlery trades from pulmonary disease and tuberculosis. Likewise, in the pottery trades and the manufacture of lead products. These have now lost to a great extent their evil name and we can therefore claim that industrial hygiene and preventive medicine have not only averted a considerable amount of probable suffering, but have warded off death. Among ship builders within the last 15 years the longevity of the

men has increased 5 years—from 53 to 58.2 years.

In summary, while conditions have materially improved in a half century's time, the one circumstance which stands out prominently and calls for special comment is the lengthened duration of sickness and convalescence.—Sir Thomas Oliver, *J. State Med.*, 38, 8: 454–463 (Aug.), 1930.—E. R. H.

Cokemen and By-Product Workers—Their Complaints and Maladies—Coking of coal goes back as far as 1590 when a patent was granted to John Thornborough, a Dean of York. The original "bee-hive" ovens have now been replaced by "retort" and "by-product" ovens. In the first condenser, tar becomes deposited from the fumes passing from the ovens and, in the second, the ammoniacal liquor is caught. In a further scrubbing benzene is removed. When the remaining material is distilled, the tar, having yielded up fuel oil, becomes pitch. Ammonium sulphate is made by adding sulphuric acid. Further by-products can be obtained such as toluol, naphthalene, pyridine and motor spirit (benzol).

There are employed at coke ovens and by-product works in England and Wales 15,000 men. For the past several years the impression has prevailed that these men suffer disproportionately from stomach troubles, while they are also prone to rheumatism, lumbago, skin eruptions, and warts—the latter frequently taking a malignant turn. The gastritis reported begins at any age and at any period of service and is severe enough to cause the men to lay off, when remissions in the stomach trouble occur. The trouble appears toxemic and is accompanied with a sense of fatigue which is out of proportion to muscular work performed. Stomach ulcers ensue in a considerable number of men. They have a sallow complexion and lose considerably in weight. The skin affections occur on the backs of the hands and forearms, scrotum and penis, also on the brow and eyelids. Bronchial catarrh is common, as might be anticipated from the exposure to heat and cold.

Twenty years ago, Sir Thomas Legge drew attention to the fact that blast furnace tar and pitch did not possess the same cancer producing qualities as those from coal tar. The pitch obtained from coke ovens and gas works and used for making briquettes is said to be the cause of more than one-half of the notifiable cases of cancer in Great Britain. Drs. Bridge and Henry found that, between 1920 and 1927, of 163 cases of cancer occurring in briquette workers, 11 per cent were located on the scrotum, 72.2 per cent on the head, arms, etc., while in 103 cases in tar distillers the malady showed itself in 39.8 per cent in the scrotum, and 37 per cent on the head, limbs, etc., and in men employed in gas works the disease was located on the scrotum in 47.3 per cent, and on the head and elsewhere in 23.6 per cent.

The particular points in the course of transit of the material where the men apparently suffer in health more than at other points are the top-oven men, the hydraulic mains men, the valve men, and the men who break up the solid pitch—these are all liable to adverse influence by dust, heat, and fumes.—Sir Thomas Oliver, *A Report by The National Union of Cokemen and By-Product Workers, Red Hill Villa, Durham, England*, 8 pp., Apr. 16, 1930.—E. R. H.

Outbursts of Carbon Dioxide in Mines—The disaster in which 150 men were suffocated in a Silesian mine has just been reported. The accident was apparently due to the penetration into a mass of disintegrated coal charged with carbon dioxide which then filled all the workings. Professor J. S. Hal-

dane in a letter to the *Times* points out that while such outbursts of carbon dioxide are unknown in Great Britain, they were described more than 30 years ago in the Gard district of France and have since occurred in Silesian and other coal fields.

In one instance the gas and coal dust shot high into the air and for a long time discharged like a volcano. Being heavier than air it came back, spread along the ground like water, and reached a village a kilometer away where it suffocated fowls and dogs, but the level at this distance was too low to kill human beings.

J. I. Graham, Mining Research Laboratory, University of Birmingham, has shown that coal in the presence of even a moderate pressure of gas will absorb a large volume of it from which enormous outbursts may occur. In British mines several lives have been lost through sudden outbursts of methane from disintegrated coal, but these are not so dangerous as outbursts of carbon dioxide.—London Letter, *J. A. M. A.*, 95, 8: 605 (Aug. 23), 1930.—E. R. H.

Glasses for Protecting the Eye from Glare—The federal specifications for the protection of eyes of industrial workers from injurious radiation specify that "shade No. 3, filter lenses are intended for glare of reflected sunlight, from snow, water, roadbeds, roofs, sand, etc." The mean transmission of visible light through a shade 3 glass is 13.9 per cent. The specification requires a fairly high absorption of ultra-violet and infra-red rays, which means that the color of the glass is greenish.

The next lighter shade is 2, with a maximum transmission of 60 per cent, but there is no provision in the Safety Code for the use of such a light shade. This is partly owing to the fact that no chances are being taken of possible injury, with attendant legal complications regarding compensation for alleged injury. Personal experience on mountain elevations, etc., in the West indicates that a shade 3 glass is necessary to relieve the discomfort from glare.

The author has been confronted with the problem of newly exploited eye glasses that come and go like the style of hats and dresses. Amethyst-colored glasses transmit almost as much of the ultra-violet and visible rays as the white crown glass generally used in spectacles. While attractive in appearance and a good sales proposition, the author could not learn of any real advantage over the ordinary spectacle glass.

The nearly colorless glasses put on the market in recent years are of two general classes such as (1) "Softlite" and "Velvetlite" which are transparent to ultra-violet rays to practically the same extent as white crown spectacle lens, and (2) "Cruxite" and "Viopake"—all of these glasses have practically the same transmission as common spectacle glasses for the infra-red rays. They transmit some 85–90 per cent of the visible rays as compared to 91 per cent in white crown lenses when perfectly clean, and some 85–90 per cent as commonly worn. They offer no protection from the glare of bright light as defined in the beginning of the paper.

Most reflecting surfaces, except snow and water, absorb a much greater amount of ultra-violet than the visible rays. Hence, we are concerned mainly with the glare of visible light and not the presence of ultra-violet radiation.

Aside from style, the purpose of prescribing these glasses is not clear. Cases are few in which it is important to reduce the intensity of average daylight. When, however, one is near ultra-violet ray lamps and sparks from induction coils dark glasses should be worn to protect the eyes from ultra-violet radiation. Unlike the sun, these artificial sources are in the direct line

of vision and unavoidably shine into the eyes.—W. W. Coblentz, *J. A. M. A.*, 90, 8: 593–594 (Aug. 23), 1930.—E. R. H.

Annual Report of the South African Institute for Medical Research for 1929—This Report is, like its predecessors, of real interest. Studies have been continued on the subjects of plague, hay fever, tuberculosis, ancylostomiasis, the typing of pneumococci and meningococci. The Department of Industrial Hygiene has continued its studies on the subject of silicosis, chiefly under the direction of Dr. Mavrocordato. Elaborate and most interesting studies on dental caries are enumerated, which should yield some most valuable information on this subject. The transmission of plague from rodent to rodent has been demonstrated in the plague research laboratory and, finally, detailed investigations on the subject of cancer have been pursued in the pathological research laboratory.

The report of the Routine Division is most interesting and enumerates the vast amount of work which this laboratory has performed, an amount too great to detail at this point.

This most interesting and valuable report closes with a list of 22 papers published by various members of the staff.—South African Institute for Medical Research, *Annual Report*, year ending Dec. 31, 1929.—L. G.

Sulphur Dioxide in the Air at the Pittsburgh Experiment Station of the U. S. Bureau of Mines—Three hundred and four determinations of the sulphur dioxide content of the outdoor air at the Pittsburgh Experiment Station of the U. S. Bureau of Mines were made between August 11, 1927 and 1928. An average amount of 0.16 p.p.m. was found. The maximum amount found, 1.1 p.p.m., existed on 2 days, and less than 1/10 p.p.m. (the minimum detectable amount) was observed on 141 days. The most frequently encountered value lay between 0.1 and 0.4 p.p.m., an amount found on 134 days. The direction of the wind was not found to be a significant factor in altering the concentration of sulphur dioxide in the air. The concentration was found to decrease with higher wind velocities and to be high on foggy or smoky days.—E. G. Meiter and C. E. Traubert, Department of Commerce, U. S. Bureau of Mines, R. I. 3005, June, 1930.—L. G.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Effects of Ingestion of Tartrate or Sodium Aluminum Sulphate Baking Powder upon Growth, Reproduction and Kidney Structure in the Rat—Many investigators have studied the adsorption of aluminum by the animal body after the ingestion of its salts and the effects on digestion and health of aluminum baking powders. This paper reports the results of sodium aluminum sulphate-calcium acid phosphate baking powder and cream of tartar baking powders on white rats, 30–50 gm. weight at the beginning of the experiment.

Commercial baking powders representing the two types were used. These were first mixed with water until reaction took place, heated, dried, ground, and mixed with food in amounts equivalent to what would ordinarily be contained in biscuits made according to recipes advocated by the manufacturers. The largest dose of S.A.S. baking powder represented 4 mg. aluminum per rat per day.

The ingestion of S.A.S. baking powders in amounts up to a dosage represented by 2 per cent of the diet and the ingestion of tartrate baking powders in amounts up to 4 per cent of the diet showed no marked injurious effects. Six generations were raised on rations containing approximately 2 per cent of S.A.S. baking powder for the first and second generations and 4 per cent for the succeeding generations. The rate of reproduction, the number of young successfully weaned and the rate of growth showed that the ration containing this baking powder is equal to similar rations containing none.

Microscopic examination of the kidneys of the animals fed according to the manner described in this paper failed to show that the length of time during which the feed was consumed or the proportions of the ingredients of the food itself brought about any pathological changes. The kidneys of the rats fed for a period of 21 months on the ration containing 2 per cent S.A.S. baking powder presented no microscopic lesions whereby they could be distinguished from the kidneys of the rats receiving the basic ration containing no baking powder residue.—J. F. Lyman and Ernest Scott, *Am. J. Hyg.*, *12*: 271 (July), 1930.

Effects of the Habitual Use of Tartrate and Aluminum Baking Powders upon the Utilization of Food in the Rat—Reference is made to the fact that the literature records only one experiment on the effects of baking powder on the utilization of food and that is the report of the Referee Board of Consulting Scientific Experts, *Bulletin 103*, U. S. Department of Agriculture. This was on human subjects who ingested baking powders containing salts of aluminum over a period of 130 days. When the intake amounted to 200 to 260 mg. of aluminum per day mild catharsis resulted but there was little or no effect on the utilization of food.

In the present experiment, albino rats were fed their respective diets for a period of about 15 months when the effects on digestion were determined. Commercial powders were employed, one a tartaric acid-tartrate type, and

the other sodium aluminum sulphate-calcium acid phosphate.

Powders were moistened, heated, and dried, ground and mixed with an adequate control diet supplemented by cod liver oil. The tartrate residue was mixed with the diet in proportions corresponding to 1 gm. of baking powder to 25 gm. of food, and the S.A.S. residue was mixed so that it represented 1 gm. of baking powder to 53.5 gm. of food. Each proportion represented the amount which would be present on a calorie basis according to recipes of the manufacturers.

The digestion periods were of 10 days, and there were recorded the composition of the diet, food consumption, feces production, and weight of animals. The determination of digestibility coefficients indicated that rats fed over this long period on baking powder residues showed no effects on digestion and no cathartic action was observed.—Ruth M. Kraft, *Am. J. Hyg.*, 12: 283 (July), 1930.

Vitamins in Dried Fruits. II. The Effect of Drying and of Sulphur Dioxide upon the Vitamin A Content of Fruits—A previous report (*A. J. P. H.*, 29: 1053, Sept., 1929) of these investigators on the protective action of sulphur dioxide on vitamin C in peaches led to the conclusion that a similar effect might be found in vitamin A. Reference is made to the recent reports on the destructive effects of sulphur dioxide on the vitamin A in cod liver oil as compared to the same vitamin in butterfat and alfalfa and the varying results of experiments on vitamin A activity in purified carotene crystals which may be explained by the variations in catalytic or oxidative action rather than a fundamental difference in the vitamin.

In the present experiment, California prunes, peaches and apricots were employed. Dried fruits were stored at 0° and the fresh fruit was ground and frozen. The SO_2 content of dried fruit was determined by the A. O. A. C. method as well as the pH of fresh and rehydrated fruit.

Rats 21 days of age were placed on a vitamin A-free diet supplemented by 0.5 gm. dried yeast per rat per day. The fruit was fed generally in 3 or 4 doses per week and was begun after the appearance of vitamin A deficiency, usually after 25 to 35 days. The fruit-feeding period lasted 56 days. The standard for feeding was the amount of fruit which produced an average weekly gain of 6 to 8 gm.

Tables show the percentage of vitamin A retention calculated on the standard of 100 per cent vitamin A content of fruit. This is based upon the dose of frozen, fresh fruit which permits at least 6 gm. gain for 8 weeks and is regarded as representing 100 per cent vitamin A content of fruit. Similar units were employed for dried fruit calculated to its fresh fruit equivalent, and the ratio between the weights required represents the vitamin retention. On this basis sulphured peaches, both dehydrated and sundried, retained 86 to 100 per cent of vitamin A in the fresh fruit and the unsulphured, sundried fruit about 90 per cent. The unsulphured, dehydrated product apparently lost about 50 per cent.

Yellow peaches were found richer in vitamin A than white varieties and there was a correspondingly less loss with this fruit whether sundried or dehydrated. Sulphured prunes showed somewhat greater retention than the unsulphured and the dehydrated sulphured 50 per cent greater retention than the sundried sulphured prunes. The lye-dipping of prunes apparently was without effect on vitamin A.

Apricots were found especially rich in vitamin A both in the fresh and dried fruit. This appears to be a governing factor in retention which was found to

be somewhat greater in the sulphured product. The vitamin A of apricots is apparently easily affected by drying since only 16 to 51 per cent of the fresh fruit value was retained, but with this loss apricots contain more vitamin A than the best of the peaches and prunes. The unusual richness in vitamin A in apricots is noted in connection with the hemoglobin regeneration effect of dried apricots reported by other investigators. The vitamin A content of apricots compares favorably with the best figures reported for spinach, egg yolk and butter.

Dried prunes and apricots were retested after storage at 0° for 12 to 14 months and results showed practically the same as before storage.—Agnes Fay Morgan and Anna Field, *J. Biol. Chem.*, 88: 9 (Aug.), 1930.

Cystine Deficiency of the Proteins of Garden Peas and of Potatoes—A previous experiment (*J. Nutrition*, 2: 225, 1930) showed that the proteins of garden peas and potatoes were deficient in cystine. Because of the small number of animals used in the potato experiment and the cooking to which the peas were subjected, the experiment was repeated.

The garden peas were shelled, passed through a hand mill, dried at a low temperature and reground. The potatoes (Ohio Red variety) were boiled, peeled, riced, dried at a low temperature, and ground.

Tables are given showing the composition of rations. The experiment on potato proteins involved 8 pairs of rats and on peas, 9 pairs. Tables are given showing the weekly gains.

The experiment showed that the growth-promoting value of the proteins of these two foods is enhanced by the addition of cystine; hence, these protein mixtures are deficient in this amino acid. These experiments failed to support the assumption that the more complete of two rations will be consumed in larger amounts.—Jessie R. Beadles, Winfred W. Braman, and H. H. Mitchell, *J. Biol. Chem.*, 88: 615 (Sept.), 1930.

Cereals and Mineral Metabolism—Ordinary foods except egg yolk have not been found to be potent in vitamin D. The severity of the experimental rickets used in testing cod liver oil and irradiated products suggests that with a less powerful rachitic diet some of the other foodstuffs might show at least a protective value in rickets.

The present work deals with wheat rations compared to oat rations on rats with adjustment of the calcium phosphorus ration. There were 4 groups in each series, 1 group in which the calcium phosphorus ratio was high, 1 in which it was extremely low, and 2 intermediate in which it approached unity.

Vitamin B was deemed sufficient since the rations both in the wheat and oats contained 60 per cent of cereal. Three per cent of butterfat was used to supply vitamin A. The experiments were conducted over a long period of time and in some instances as much as 135 days.

The results show that in the wheat series the growth on the high calcium phosphorus is relatively poor compared to the growth in the groups where the calcium phosphorus ratio approached unity irrespective of the amount of food consumed. In the low calcium phosphorus group growth was not so good as those in which the ratio approached unity which was better than in the high calcium phosphorus lot.

The rats on oat diet showed a similar relationship but in all cases the growth was not so good as with the comparable wheat group. The conclusion is reached that with mild rachitic rations such as in this experiment wheat contains sufficient vitamin D to protect against rickets and to permit spontaneous healing if sufficient time be given. The oat diet is less effective in spon-

taneous healing. Both experiments indicate the effectiveness of the calcium phosphorus ratio which appears optimum when nearest unity.

Reference is made to recent investigations showing that rolled oats is more rachitic than wheat and that calcium phosphorus retentions were higher on a wheat than on an oat diet. The author ascribes the differences in the wheat and oat diets to differences in variation of vitamin D content.—M. S. Fine, General Foods Corporation, *Cereal Chemistry*, 7: 456 (Sept.), 1930.

Tooth Growth in Experimental Scurvy—In this experiment the normal growth rate of the teeth of guinea pigs was determined. Animals were placed on the Sherman-La Mer basal diet with 1 per cent cod liver oil. During the test the animals were scored by the Sherman method for scurvy and weighed every 5th day.

At the conclusion of the experiment the animals were killed and the lower jaws, ribs, and extremities were studied histologically. The incisor teeth were checked at various levels for determining the degree of scurvy. The vitamin A supplements were contained in diets of orange juice, tomato juice, turnip greens and mixed green vegetables.

On 5 c.c. of orange juice daily the rate of tooth growth increased and there were slight scorbutic lesions in the incisor roots but no scurvy evident by the Sherman score, which is based on the weight curve plus clinical observations as to pain, hemorrhage, etc. One c.c. of orange juice increased tooth growth but pronounced scurvy was found in the incised teeth. Tooth growth was scarcely increased on 0.5 c.c. orange juice, and advanced scurvy was present contrasted with the Sherman score of moderate scurvy.

Animals on the basal diet alone showed a tooth growth for the first 15 to 20 days which then ceased but recommenced after the administration of 5 c.c. of orange juice daily. By studying the appearance of scorbutic substances in amputated teeth compared to those uncut and subjected to normal chewing strain it was found that the stress is a definite factor in the scorbutic process. Photomicrographs show the changes in the odontoblasts and the formation of osteodentin.—Gilbert Dalldorf and Celia Zall, *J. Exper. Med.*, 52: 57 (July 1), 1930.

PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.*

A Nursing Program in a County Health Department—At the Conference of Health Officers and Public Health Nurses held at Saratoga Springs, N. Y., in June, Marion Sheahan, R.N., Assistant Director of the Division of Public Health Nursing of the New York State Health Department, in discussing "A Nursing Program in a County Health Department" gave a summary of the purposes of a nursing division in a county health unit:

1. Provide a supervisory service by a well qualified nurse or nurses to:
(a) Direct the nursing activities of the county health department in order to relieve the county health commissioner of the detail in connection with the work,
(b) Assist in outlining and maintaining an adequate program of work,
(c) Aim to correlate the nursing services of the county,
(d) Aid in placing qualified nurses in the field,
(e) Introduce new nurses into various fields to insure standard work,
(f) Outline and conduct staff education on a county-wide basis, offering this service to all nurses no matter by what agency employed,
(g) Coördinate the nursing work of all agencies so as to utilize it to best advantage in promoting a county-wide health program under the direction of the county department of health,

2. Provide sufficient staff nurses to make service available to areas not covered by existing agencies. Also, offer assistance to local organizations, for example, in the event of communicable disease outbreaks, round-up of preschool children, tuberculin testing of school children, inspection of boarding homes, maternity homes, and similar activities.—

Health News, New York State Department of Health, pp. 147–148, VII, 37: (Sept. 15), 1930.

Pearl McIver, Director of the Missouri State Department of Public Health Nursing, in a paper read before the 1930 Conference of Indiana Health Officers at Fort Wayne in September, made some further points on the relation of the public health nurse to county health work. She said that educational work through individual and group instruction should occupy the largest part of the nurse's time. Rather too often we find a health officer who feels the chief duty of the public health nurse is to tag along with him and wait upon him much as a surgical assistant would in an operating room. "Some public health activities require the combined efforts of physician and nurse, but time is often wasted by too much 'joint work.'"

Westchester County Shows the Way—The Westchester County (N. Y.) Health Department and the Northern Westchester District Nursing Association have worked out a mutually helpful arrangement

. . . to provide the necessary regulation and instruction for cases of communicable disease in towns served by the association and that are under the direct supervision of the central office of the County Health Department. Local nurses in the association in these towns will visit all reported cases of communicable disease requiring legislation, to give instruction relative to isolation and concurrent disinfection and to post placards as provided by the State Sanitary Code. Epidemiological investigations will continue to be carried on by the County Health Department, which will

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 126 State House Annex, Indianapolis, Ind.

also offer consultation service for diagnosis, when desired.

A similar arrangement has been made with the local nurses in Hastings, Larchmont, Cortlandt and Greenburgh, where there are no local health officers.—

The Link, Westchester County Health Bulletin, 5, 7, p. 3: (Aug.–Sept.), 1930.

Public Health Nurses in a Diphtheria Campaign—An intensive diphtheria campaign was carried on in 2 districts in Detroit by a group of nurses in the Detroit Department of Health from July 2 to September 2. The parents of 23,748 children were interviewed, and 38.25 per cent of these had already had toxin-antitoxin; the nurses prevailed upon the parents of 39.39 per cent of these remaining to have it given.

It is significant to find that the intensive house-to-house canvassing resulted in the immunization of an appreciably larger proportion of younger and more susceptible children than did the general city-wide educational campaign. For example, only 51.1 per cent of the children given toxin-antitoxin before the intensive work of this summer were under six years of age, while of those protected through the nurses' efforts this summer 67.4 per cent were under six years of age.—

Age Distribution of Children Protected Against Diphtheria, *Weekly Health Review,* City of Detroit Department of Health, Series 11, 38: Sept. 20, 1930.

It seems impossible to find the death rate from diphtheria in the 1–6 inclusive age group, but authorities agree that this is the group that needs toxin-antitoxin most for, as Lee says, "A large number of children have been immunized, but unfortunately most of this work has been done among the school children and very little among the preschool population. Two-thirds of the deaths from diphtheria occur in the 0–4 age group."—Walter W. Lee, M.D., Diphtheria, Its Treatment and Prevention, *A. J. P. H.,* XVIII, 10: 1246 (Oct.), 1928.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Exhibits at Fort Worth—Health railroad cars, educational and technical or commercial exhibits as a whole gave but little evidence that use is being made of what we actually know about the planning and preparation of graphic material. The Harmon prize display of the New York Diphtheria Commission was excellent of its kind, and several educational-commercial displays were colorful and distinctive. Specific suggestions can be offered exhibitors upon request.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

People Who Can't or Won't Read—Five million illiterates—who had "no schooling whatsoever"—reported in the census; one in four million and a half soldiers and sailors who did not show "ability to read and understand newspapers and to write letters." *They cannot read our newspaper articles, pamphlets, folders, leaflets, house organs—not even our posters.* What other means do we use for reaching them? Is it worth while to check up on illiteracy records—in our state or city—to determine where there is special need for unusual efforts to reach such groups?

A Useful Source Book—"Health Education in the Public Schools," by Anne S. Whitney; "Popular Health Education," by Ira V. Hiscock; and "Publicity in Social Work," by Mary Swain Routzahn, appear among 197 topical articles (nearly 50 on phases of public health) in *Social Work Year Book*, a new publication of the Russell Sage Foundation. $4.00.

Those articles briefly state the history and present status; training requirements and opportunities; developments and events, 1929; and legislation, 1929, supplemented by reading references and descriptions of the interested national organizations. Doubtless the tentative classification of these national agencies, a useful feature, will be done better in the next issue of the *Year Book*. The present listings under health education and publicity include several not primarily concerned with these subjects and omit many others doing as much as most of those listed. A basis for selection is difficult to work out.

Let's Start the Experiment Right—The Committee on Administrative Practice has made another practical and forward-looking contribution. "For experimental use" the committee offers a set of forms for recording departmental activities. We hope those concerned with health education will join in the experiment. We suggest at the start that you consider a few changes.

In the first form—Cumulative Monthly Report—among the nine columns given to "Popular Health Instruction" are two headed "Health plays and motion pictures" and "Attendance." Health plays are *not* accounted for in the *Appraisal Form for City Health Work* on which this report form is based and so that item is out of place in the new record form. Moreover, plays may be considered an occasional and incidental form of popular health education and the least of the forms to be conducted by a city health department.

Another column in this form is headed "Circulation of fixed publications." "Fixed publications" is not used in the *Appraisal Form*, and it is not an accepted term for any specific form of publicity. It would seem better to use words that carry over from some item in the *Appraisal Form*.

In the second blank form now offered—called a Summary of Activities for the Month—there is a heading for "Number of pamphlets distributed" for which there is no corresponding space in the preceding form.

In the introduction to the blank forms it is said of the Summary that "it is easily compiled each month from the Cumulative Report." But in the first form there is that space for the *combined total of plays and motion pictures*, while in the second form the corresponding blank reads "Number of *health films* shown"—that is, in some fashion the health officer will "easily compile" the figure for the number of motion picture showings out of a total made up of motion pictures and plays.

Of much less importance, doubtless, is the upper heading on page 25 of the first form: "Health Classes, Plays and Films." Why there should be this extra heading is not clear.

In neither of the blanks are there spaces for all of the items included in the *Appraisal Form*.

Getting Health Workers to Read About Health Work—The first month 126 magazines were requested—143 the second month—as a result of a mimeographed bulletin, "Selected Articles from Public Health Magazines," prepared by the Los Angeles County Tuberculosis and Health Association (132 West 1st St., Los Angeles), and issued

in the name of that body and of the County Health Department.

This list does not pretend to be a comprehensive index. Its purpose is rather to stimulate interest in current health material among health workers in Los Angeles County by bringing to their attention timely and readable articles.

A mimeographed reply blank is enclosed with every copy of the list. We hope that future issues will refer to this Education and Publicity department, and other departments in the *Journal*. We thank Prof. Ira V. Hiscock for bringing this excellent device to our attention.

How "Old" Is the Reading Public?—Under this title Robert R. Updegraff discusses whither "in our copy, are we over-shooting the mass mind?" The author tells of an especially popular high school textbook on ancient history and how the author of the book explained its popularity.

"Well," said he, "there is a perfectly good reason. That book was intended as a text for boys and girls 13 or 14 years of age. When the manuscript was finished, and before a single line of it was set in type, I paid a boy of 11 to read it and mark every word he did not understand. Then I went through the book and inserted simpler, understandable words or phrases for every word he had marked. Or I rewrote the sentence entirely in the interest of greater simplicity."

Mr. Updegraff tells of his own first published story, "Obvious Adam," which has sold up in the thousands through 15 years.

After the story was finished I went through it page by page, sentence by sentence, methodically challenging every word of more than two syllables. Wherever a shorter, simpler word could be substituted, it was done. The result was rather startling.

Four questions are suggested by the author to be raised before using "big" words:

1. Is there a simpler word that will do?
2. Can it be left out entirely by rewriting the sentence in simpler form?
3. Will it mean to the reader what it means to me?
4. Will it go through the reader's mind as "just one of those words" or will it actually register something very definite?—

Advertising and Selling, 9 East 38th St., New York, N. Y., Sept. 17, 1930. *25 cents.*

Peas, Potatoes, Pumpkins—The following from the *Daily Bulletin*, at Fort Worth, was prompted by program announcements at Fort Worth of various sessions in which all discussion of three, four or five papers in a session was combined after all the papers had been given:

Were you ever in a meeting for the discussion of the technique of successfully raising peas, potatoes and pumpkins—simultaneously?

Peas, potatoes, pumpkins; pumpkins, potatoes, peas; peas . . . what a mental porridge would result!

And what mental confusion must result when three or four papers presented in a convention program are discussed in the same period?

Program committees, please copy.

Headquarters at Fort Worth—For the first time in a number of years there was no Health Education and Publicity Headquarters at the Fort Worth meeting of the A. P. H. A. If acceptable space is provided at Montreal we will try again next October to bring together outstanding examples of health publicity and samples of materials of use to the publicity worker as has been the custom of this department.

"Have You a Book?"—Thus is headed a report in *The Survey* (Oct. 15, 1930) of a checkup of professional and general books and magazines read by social workers in Hartford, Conn.

Is it not worth while to give thought to the professional reading of staff mem-

bers and of all health workers in our city or state? Do we "all have a book"—and therefore do not give other books a chance to contribute to our professional equipment?

We can give details of the Hartford experiment if our readers are interested.

When Editors Fear Their Readers—Even yet some newspapers fear to mention syphilis and gonorrhea in their news columns. Some of the few which carry advertisements of quacks and nostrums will not mention the diseases by name in news articles.

When such a condition exists in a city it is suggested that a tactful man, sympathetic towards the editors' viewpoint, personally discuss the subject with the editors. The caller may go armed with information about what other newspapers and periodicals have done and what has been said on the subject in *Editor & Publisher*, the influential organ of the newspaper world.

Among the material available: the series of advertisements placed in the *Saturday Evening Post* by the American Social Hygiene Association; advertisements in daily papers of the New Jersey and West Virginia State Departments of Health; advertisements in Chicago dailies; discussion in *Journal of Social Hygiene;* discussion in *Editor & Publisher*. Doubtless the American Social Hygiene Association, 370 7th Ave., New York, N. Y., could provide typewritten copies of this matter.

Please report to this department examples of news mention, advertisements or discussion of the subject.

Tests and Checks on Health Education—Every scrap of information about any form of test or check on methods or materials is desired by the editor of this department. Please send in any clue to anything you know about or have read about even of the most informal nature.

The Challenge to the Publicity Worker—Said President Hoover, in a message addressed to the School of Journalism, University of Missouri:

> The greatest challenge to the ingenuity of journalists is to make these things (science, social advance, civic idealism) as interesting to the public as are the more familiar subjects which apparently must be treated in terms of conflict.

Health Books for the Public Library—"The Most Suitable Health Books for the Public Library" are discussed and listed by James A. Tobey and Raymond S. Patterson, in *Library Journal*, 62 West 45th St., New York, N. Y., Nov. 1, 1930. *25 cents.*

> The first test of a book on such an important topic as human health is its scientific accuracy. There is no room for fads and follies, nor for individualistic medical notions and opinions. The second essential characteristic is readability, together with a practical and reasonable presentation of important facts in an attractive style. A book for serious reading need not be a dull book. It should, moreover, avoid technical language and be clear, concise, and cogent, but thorough, logical, and diverting. There is plenty of romance in this adventure called health, in this drama which is the game of life. The books listed and described comply with the specifications, and others. They are arranged under six divisions, with, of course, an overlapping between them. As an introduction to the general subject, five books have been included under the caption, "The Background of Health." Perusal of these particularly entertaining books will result not only in an absorbing fund of useful information, but also in an adequate conception of the science called public health.
>
> Selections from the copious quantity of books on baby care are conspicuously absent from the list on "Maternal and Child Hygiene." As in the case of the health habits, such material may be readily obtained in numerous reliable pamphlets and books issued by official and voluntary health agencies and by reputable commercial organizations interested in public health.

An Effort to Check Results—How can patients needing medical attention

be brought under treatment? Does popular health education really result in bringing under medical care persons infected with syphilis and gonorrhea?

For some years various types of health publicity have been used to induce persons to seek treatment and it has been assumed that such education has been effective. The results, however, have not been measured nor is there available data to show the value of different types of health propaganda.

Demonstrations are being carried on in New York, Chicago, and Boston with the object of finding out something about the value of various methods and materials used in health propaganda. The Bellevue-Yorkville Health Demonstration, the City Health Department, the New York Tuberculosis and Health Association and the American Social Hygiene Association are sponsoring the New York demonstration which is confined to the Bellevue-Yorkville area. This area is the district between 14th and 64th Streets on the east side of Manhattan, with Fourth Avenue as the western boundary below 42d Street, and Sixth Avenue above.

Lectures, motion pictures, posters, pamphlets in various languages are being used in a wide-spread effort to reach every section of the population. Hospitals, clinics, and doctors are cooperating by supplying the number of their patients under treatment for syphilis and gonorrhea before, during and after the campaign. These figures will give an indication of the value of popular health instruction, the object of which is to bring the infected under treatment. The demonstration will continue about three months, reaching its height in November.

Similar education methods will be employed in the Boston campaign which will occupy a part of several months; while the most intensive part of the Chicago campaign will be limited to one week.—Doris G. Chandler.

Shop Talk and Working Tools—Such will be found in every issue of the *News Bulletin* of the Social Work Publicity Council, 130 East 22d St., New York, N. Y. *Sample free.* The October, 1930, issue discusses "Come and See" visits and how to make more of them; mentions that the S. W. P. C. prize newspaper story, "Health and Charm at End of Rainbow by 15,000 Girls," was reprinted in the September issue of *Everybody's Health,* St. Paul (*10 cents*); that Association of Community Chests and Councils, 420 Lexington Ave., New York, N. Y., has albums of photographs by Hine, Myers & Moss (prints can be bought at modest prices); starts a discussion of how to secure bequests; explains that a few dates are open for convention or local visits by the collection of prize award publicity specimens; and describes numerous publicity specimens and ideas.

"Telling the Public"—Old truths are re-stated by Edith M. Ross, a county nurse (*Survey,* 112 East 19th St., New York, N. Y., Oct. 15, 1930. *30 cents*):

> Are most of us eye- or ear-minded? Do we notice more, do we remember better, what we see or what we hear? From my own experience, first as a county nurse, then in state work, I find that people remember better what I say if they can see at the same time something allied to the subject of my talk. Charts, especially in speaking to adults, always help. Tack maps are nearly always fascinating. There is something concrete, vital about them—something that takes away the intangibility of mere figures and brings facts home to us. Our public is far more hungry for information than we imagine. But we must be careful not to repel it by trying to feed it dull, dry, lifeless facts.
>
> The staff nurses of the Minnesota Public Health Association, when they make school inspections, use a small cloth dog or monkey or a "Felix" cat to arouse the interest of the younger children. Into any of these, which consist of a head and forelegs, we run

the fingers of one hand. Then we get the children to ask it questions such as: "How many glasses of milk do you drink?" or "What time do you go to bed?" And the dog or cat or monkey, as the case may be, waves one paw slowly to indicate the number of glasses of milk he consumes or the hour at which he retires. He shows them, too, how he washes behind his ears, how he brushes his teeth. There are few health habits which these toy animals cannot help us expound. And when I return the following year, I find that what Coco, my monkey, or Milko, my dog, has told them has not been forgotten.

TRY ONE OF THESE?

"For 700 years traders have tried their cleverest advertising stunts on merchants who come annually to the Leipzig fair."—Caption under a photograph of a man with a big clock on his head. Probably makes the hands go round—or the alarm to ring. Try "Now is the time for a health examination(?)"

New displays of health pamphlets may be found in the lobby of the Health Department which is entered from Third Street. These include pamphlets about measles, cancer, smallpox, tuberculosis, diphtheria, heart disease, whooping cough, goiter, influenza, tonsils and adenoids, common colds, and the latest numbers of this Health Department's bulletins. In addition, there will be found in the Health Department up-to-date files of health magazines and health books which the Public Library does not keep. Pamphlets are free to individuals or in quantities to organizations. Books and magazines may be borrowed by signing up for them.

—Racine, Wis., Department of Health.

An effective "testimonial"—a letter of thanks from a client—is reproduced in facsimile, with the street address and the signature crossed out by pen—on a folder going with an appeal letter from the New York Diet Kitchen Association, 578 Madison Avenue, New York, N. Y.

The latest health tabloid is "North Harlem Photo News," issued by the Diphtheria Prevention Commission of the Department of Health, New York, N. Y. Includes "Harlem First to Have New Health Center," "Children, Rich and Poor, Often Suffer from Lack of Right Food Says Expert," "Magic Rings of History," "The Inquiring Reporter" (who asks: Do you save money throughout the year for your summer vacation?), "Voice of the People," etc. 17 pictures. Much display type. *Free.*

The Diphtheria Prevention Commission and the Bellevue-Yorkville Health Demonstration have amply illustrated the possibilities in making health information and suggestions *look interesting.*

Some cities—or states—might try the idea in a 2-page form to reduce the cost.

MAGAZINE ARTICLES

"The Church and Birth Control," by Right Rev. Charles Fiske. *Atlantic.* Nov., 1930. "The Lambeth Conference marks a great departure."

"Doctor and Patient." *Nation.* Nov. 5, 1930. "The remedy . . . lies in the reorganization of the industry."

"Looking for Trouble," by Ruth F. Wadsworth, M.D. *Colliers.* Nov. 8, 1930. "Looking for trouble in order to avoid it, otherwise known as periodic health examinations. . . ."

"Mothers in Danger," by Ruth F. Wadsworth. *Colliers.* July 5, 1930.

"The Patient Looks at Doctors." Anonymous. *Harpers.* Nov., 1930.

"To Be Or Not To Be?" by Louis I. Dublin. *Harpers.* Sept., 1930. "The facts about suicide."

"Who Pays the Price?" by Frances Sage Bradley. *Mountain Life and Work,* Berea, Ky. Oct., 1930. *30 cents.* A story presentation of need for maternity and visiting nurse services.

LANGUAGE

"Odds Bodkins" in *Advertising & Selling* quotes from Clyde Fitch:

This time you have realized exactly what I was striving for—honest simplicity of language and unconventional treatment of conventional situations.

BOOKS AND REPORTS

The First Year of Life—*By Charlotte Buhler. Translated from the German by Pearl Greenberg and Rowena Ripin. New York: The John Day Company,* 1930. 281 pp. Price, $3.50.

The translation of the researches of Prof. Charlotte Buhler and her associates upon the behavior reactions of the infant throughout its first year has made available to English readers the most elaborate and extended study of this age period that has yet appeared. It involves the continuous day and night observation for 24 hours of 5 children in each month of life and the meticulous recording of their behavior. The investigation was carried on for the most part in 1926 at the Reception Home for Children in Vienna.

Part 1 is devoted to a discussion of the negative, positive and spontaneous reactions of developing infants; the protocols carefully describing every movement and expression for a number of typical days are given in extenso. The time occupied by sleep, dozing, in taking food, in negative reaction, in quiet waking, in negative and impulsive movements, is graphically charted. An inventory of the observed behavior for each month of the first year is given.

In part 2, a series of tests is suggested which are intended to ascertain how the child develops in physical and mental control of himself, in social relationships and in the manipulation of materials. As a basis for the tests the inventory of behavior above referred to was used. The materials needed for these tests and the method of application are carefully described for each month of age.

The author is confident that these various tests may corroborate or reverse a casual judgment. Children thought to be retarded or accelerated in development were found to be so only apparently. Children socially responsive are usually thought to be abnormally bright, when complete testing indicates that they may be slow in manipulating material.

In a series of children retested after 6 months, the results obtained agreed with those in the first examination.

The book covers a difficult field. It is an attempt to estimate the potential capacity of the young infant. There is not infrequently a lack of clearness in expression due possibly to the effort of the translators to follow the original text too closely.

If the most important study of mankind is man, it is desirable that this study begin at the earliest possible age. This is the objective of these painstaking observations.

J. H. Mason Knox, Jr.

Industrial Hygiene for Schools—*By Jesse Feiring Williams and Delbert Oberteuffer. New York: McGraw-Hill,* 1930. 271 pp. Price, $2.00.

This small volume has been designed for the purpose of indicating health problems in modern industry and for pointing out health guides for general living to young men and women who are about to enter industrial life. That this has been achieved there is no doubt, for a large number of the problems of industry are discussed, at least, briefly. Perhaps the greatest defect of the book lies in the fact that many of the discussions are so brief that the content has suffered "by compression"; the sections devoted to the subjects of ventilation, dusts and poisons are examples of this. The chief virtue of the

book lies in its scope and the many excellent illustrations which serve to enhance interest in an already very readable volume.

LEONARD GREENBURG

Dictionary of Biological Equivalents. German-English—*By Ernest Artschwager. Baltimore: Williams & Wilkins,* 1930. 239 pp. Price, $4.50.

This dictionary gives the equivalent in English of about 15,000 German scientific terms of general use in the biological sciences. It is somewhat more complete in the botanical, pathological, and anatomical fields than in the zoological and physiological. The plates illustrate a few morphological details of plants and animals. Useful lists of common German abbreviations, of irregular verbs, of metrical equivalents, of important reference books, and of related dictionaries supplement the verbal ones.

The utility of this work lies in the fact that the smaller German-English dictionaries rarely contain the definitions of the compounded scientific words and the assembled definitions of the elements do not always reveal the meaning of the compound. This compilation is thus a time-saver and a convenience for the biologist.

C. A. KOFOID

Artificial Sunlight—Combining Radiation for Health with Light for Vision—*By M. Luckiesh, D.Sc. New York: Van Nostrand,* 1930. 254 pp. Price, $3.75.

In this book, the author, who is recognized as an authority upon the subject of light, has brought together in readable fashion a great variety of data concerning the effects of radiant energy and the physics of the subject. A perusal of this work should temper irresponsible and enthusiastic imagination, which too often has been the basis of claims made for the benefits of light in the ultra-violet region.

A real justification for an authoritative reference book of this sort is offered in the following quotation: "Quackery flourishes in the twilight zone of knowledge. Likewise something closely akin to it develops during the same period—practices based upon unquestionable sincerity but lacking adequate knowledge of the nature or of the effects of the alleged remedy." With so complete and so readable a source book as is furnished by Dr. Luckiesh there now seems no longer any excuse for exuberant and unjustified expectations regarding the value of light.

The author presents logical reasons for his expectation that a new type of lamp described extensively in this book will supply a combination of radiations for health and for vision. If this new lamp is as meretorious as is the large body of convincing scientific experimental data adduced in support of its design, it may indeed be the introduction to an era in which "artificial sunlight can be more than a safe and unfailing substitute for a midday, midsummer sunlight during the entire year."

The book is attractively printed and arranged and reasonably well indexed.

JOHN W. M. BUNKER

Trauma, Disease, Compensation—A Handbook of Their Medico-Legal Relations—*By A. J. Fraser, M.D. Philadelphia: F. A. Davis Company,* 1930. 506 pp. Price, $6.50.

The tendency of present-day compensation acts is undoubtedly to make more liberal provision for accidents and diseases occurring in industry. Increased knowledge of compensation laws and their provisions on the part of workers and lawyers has had the effect of bringing suits for compensation of all kinds which have never before been brought into court.

The effect of these forces has been

to increase the number of cases of all kinds and the types of these cases continue to present new, interesting, and difficult problems for solution by the medical expert and the compensation commissioner.

The volume at hand is essentially a compilation of compensation decisions and medical opinions concerning injuries and diseases of all the organ systems of the body. The final chapter is devoted to rating schedules for the apportionment of permanent disability.

The effects of trauma may be localized or general. They may be manifest in the traumatized region or at some more distant point. The effects may be immediate or remote in time, or they may be continuous in nature and form a chain of events, the nature of which and relation to the original injury it may be the duty of the medical expert to discover.

The present volume presents a most valuable discussion of these relationships in a manner which is readable, informative and accurate. Compensation attorneys, medical experts and compensation commissioners should find this an excellent addition to their libraries.

LEONARD GREENBURG

A Practical Medical Dictionary—*By Thomas Lathrop Stedman, M.D. (11th rev. ed.) Ill. New York: Wood,* 1930. 1222 pp. Price, $7.50.

There is little to say about a dictionary which has gone through 11 editions, all of which have been favorably received. Dr. Stedman's work has made its place on merit. The latest edition has maintained the high standard of those preceding it. One must concede to the author of a dictionary the right of judgment as to the inclusion of certain words. Practically all dictionaries, for the sake of completeness, include many words which are useless to the vast majority of readers. There are some omissions from this volume which we consider unfortunate, though they do not seriously affect its general value. The omitted definitions might well have taken the place of some which are given.

The volume ends with appendices giving a list of drugs, their doses and uses, weights and measures, temperature and barometric scales, chemical elements, pathogenic organisms and pathogenic microparasites. The printing is excellent, the type clear, and the illustrations good. The book can be entirely recommended.

M. P. RAVENEL

Tobacco—*By Walter L. Mendenhall, M.D. Cambridge: Harvard University Press,* 1930. 69 pp. Price, $1.00.

This is one of the Harvard Health Talks, No. 17, delivered as a popular Sunday afternoon lecture. It gives many facts concerning tobacco and the effects of its use, useful tables of the amount of nicotine contained in many brands of cigarettes, and analyses of the composition of cigarette smoke.

It begins in a tone of levity which does not impress a serious reader favorably. It ends by leaving the matter entirely to the judgment of the individual. Certain important studies are not mentioned. On the whole, it is a fair statement of facts as far as known, but contains some senseless quotations from extremists on both sides which have no scientific value.

M. P. RAVENEL

Science in the Kitchen. The Selection, Care and Service of Foods—*Pittsburgh: Mellon Institute,* 1930. 82 pp. Price, $.60.

This booklet contains much helpful information written in language which housekeepers generally can understand. In the section "Intelligent Purchasing of Foods" the biological value of proteins is referred to without explanation

as to its meaning, but perhaps this will stimulate study. The author's method of discussing the calorie is especially good. A possible criticism in the section "Good Meals for the Young Home Maker" is that too many unusual and expensive foods are recommended. On the whole it is one of the best popular discussions of foods which the writer has seen. E. V. McCOLLUM

Introduction to Mental Hygiene—*By Ernest R. Groves and Phyllis Blanchard. New York: Henry Holt,* 1930. 467 pp. Price, $4.00.

Not being a specialist in mental hygiene, the writer has undertaken to review this book with some hesitation, in spite of an interest in the subject which has grown from year to year. A critical review will not be attempted. The great difficulty with most books, from the standpoint of the nonspecialist, is that they are hard to understand, and while the writer is not competent to criticise them further, he feels that they have not been of much value to many who would like to know something of the subject, even though they have no idea of specializing in it. He has for a long time been convinced that the average doctor should know more about mental hygiene, and therefore welcomes a book of this type.

The authors of this book have had experience in practical work as well as in teaching, and it is apparent that they can write understandingly for the educated layman. Such problems as those of childhood, adolescence, marriage, religion, school and college, recreation, etc., are necessarily of interest to everyone in this complex world.

Each chapter ends with suggestions for classroom discussion and written reports, and some illustrative cases are given. There can be little doubt that the average university faculty, medical as well as lay, knows little about mental hygiene, and often cares less, due to the fact, probably, that it is a new science, and even among physicians is regarded as an abstruse specialty for the few. The authors discuss some methods by which faculties may be interested, and one cannot read this book without becoming convinced that knowledge of the subject which it discusses should be widely disseminated.

Of the many problems which arise in the lives of all, there is scarcely one that is not discussed sanely and helpfully. The great value of the book from the standpoint of the reviewer, apart from its soundness, is that it is understandable, and one does not have to be versed in the language of the alienist to profit by it. The reviews of the book by specialists have been favorable from the professional standpoint. In view of these and his own experience with it, it is recommended to the average reader with confidence. The printing and make-up are excellent.

M. P. RAVENEL

Tuberculosis Among Children—*By J. Arthur Myers. Springfield, Ill.: Charles C. Thomas,* 1930. 208 pp. Price, $3.50.

During the current year an attempt is being made to emphasize the importance of and to spread the knowledge about childhood tuberculosis. It is, for this reason among others, important to call attention to Dr. Myers's book on tuberculosis in children. The book contains little that is new but summarizes well what is known. It is of interest to note that in the diagnosis of tuberculosis in infancy and in childhood two measures only are of much significance, the tuberculin skin test (preferably the intracutaneous) and the roentgenological examination. In prophylaxis the importance of infection from tuberculous infants, children, and adults is stressed but no opinion is ventured upon the advisability of the use of BCG.

In the treatment of tuberculosis at these ages life in the open is less helpful, he thinks, than in a well ventilated room with the temperature and moisture controlled. Dr. Myers attributes to McPhedran the discovery that some of the hilar shadows are not glands but blood vessels seen end-on, while the reviewer has always been under the impression that John Weber of California first called attention to it. It is of interest to note that these little patients can be given too much fresh air. The possibility of a filterable form of the tubercle bacillus and the great value of diet in the treatment of lupus are not mentioned.

The author mentions combining X-ray and heliotherapy in the treatment of cervical adenitis but fails to warn of the danger of an X-ray burn when both are applied over the same area. It is jarring to see the word hemorrhage used as a verb. In another edition it is to be hoped that the quantity of tuberculin will be given in cubic centimeters and not in milligrams.

The book is excellent, typographically pleasing, and it is hoped and predicted that it will have the large circulation that it deserves. LAWRASON BROWN

Report on Methods of Analyzing Butter—*Geneva, N. Y.: New York Agricultural Experiment Station,* 1930. Price, $.25 each report.

The American Dairy Science Association through its Committees on Chemical and Bacteriological Methods of Analyzing Butter has recently issued a report describing these methods. This appeared in the *Journal of Dairy Science* for September, 1930, published by the association.

The report on the chemical methods of analyzing butter has been prepared under the general supervision of Dr. A. C. Dahlberg by a sub-committee consisting of Professor E. S. Guthrie, Chairman, Professor V. C. Manhart, Professor D. H. Nelson and Professor H. B. Ellenberger. The chemical section of this report is largely taken up with a discussion of the two general methods of making a complete analysis of butter in creameries. These are the procedures recommended by the Association of Official Agricultural Chemists and the Kohman test. The former method is generally used by federal government and state chemists, but the latter test is simpler of operation and satisfies the practical creameryman better. The entire discussion of methods is from the standpoint of a complete analysis of butter in the laboratory rather than for a rapid churn test and has been drawn up for industrial laboratory men rather than for the official control laboratory.

The microbiological methods have been drawn up under the general supervision of Dr. R. S. Breed by a subcommittee consisting of Professor E. H. Parfitt, Chairman, Dr. E. G. Hood, Professor B. W. Hammer and Professor H. Macy. Like the report on chemical methods this report has been drawn up primarily for industrial laboratory workers, and it gives a series of suggested methods for determining the number and kind of microörganisms in butter rather than an official procedure. Naturally the greater part of the report has been taken up with a discussion of the determination of the number of yeasts and molds in butter. This section is followed by a discussion of methods of determining the total number of bacteria present, the number of protein digesting bacteria present, and microscopical methods of examining butter for microörganisms.

This is the second in a series of reports on methods in analyzing dairy products to be issued by the Dairy Science Association, the ice cream report having been issued in 1927. Reprints of either report are available.

R. S. BREED

The **Measurement and Control of Municipal Sanitation.** *Committee on Uniform Street Sanitation Records of the International Association of Street Sanitation Officials, Chicago: 923 East 60th Street.*

In an address before the Sanitary Division of the American Society of Civil Engineers last January the reviewer pointed to the unsatisfactory state of development of municipal cleansing service in the United States and showed the impossibility of getting from the large cities figures by which to judge the relative cost of this work. The annual per capita cost among 24 cities answering inquiries ranged from $.65 to $4.46, according to the official data. Obviously the reports did not always cover the same items. There was no standard method of reporting or measuring the work done and in many instances it was impossible to get a clear picture of it. This situation could and should be changed.

The International Association of Street Sanitation Officials, made up largely of persons engaged in street cleaning and the collection and disposition of municipal refuse in the United States and Canada, appointed in 1928 a committee to collaborate with the National Committee on Municipal Standards to prepare a report on standards of measurement for this kind of service. The International City Managers' Association also entered with money from the Julius Rosenwald Fund and the University of Chicago, a part of which could be devoted to the committee's work. The report here reviewed is the product of this joint movement, or perhaps more accurately of Donald C. Stone, Gustave A. Moe and Clarence E. Ridley, whose advocacy of modern scientific business methods in municipal administration has attracted much attention.

Despite its title, the report has nothing to do with the measurement and control of sanitation, except as related to the collection and disposal of municipal waste, snow, and the cleaning of catch basins, and in the field which it does cover, no help is offered on the subject of standards of cleanness or efficiency. These omissions are fully realized by the authors, who say they must be "taken into consideration," but do not tell how this should or can be done. And so with snow removal, the difficulties connected with measuring this work are catalogued, but no measure is proposed. Here is an old question which has puzzled commissions of engineers.

Perhaps no question of municipal administration offers so many difficulties to those who would introduce scientific methods of measurement and cost accounting as street cleaning, refuse collection and disposition, and snow removal.

Of the 3 parts into which the report is divided, (1) the need of measurement standards in municipal sanitation, (2) measurements applied to sanitation activities, and (3) records and cost accounting procedure, the first is the longest. The report is a vigorous argument for the adoption of uniform and suitable methods of measuring and recording the work done in cleaning street pavements and collecting, transporting and disposing of the solid refuse of the streets and houses, and for sound records which mean something. As the authors point out, "Accurate records of work performed and its cost are vital to good budgeting."

The unit proposed for street cleaning is the "curb mile" or the "cleaning of half of the street parallel to each curb line, including intersections, for a distance of one mile." By this is meant the combined lengths of both curbs. This unit does not show how many square yards are cleaned nor how many times the whole surface is gone over. The width of the street is not

taken into consideration. The unit has no relation to the dirtiness, state of repair, or kind of pavement, the season, weather, state of the traffic, or any other of the many conditions which enter into the difficulty and cost of this kind of work, and make it so hard to measure satisfactorily.

The report favors the short ton as the unit of measurement of refuse, but when it cannot actually be weighed, recommends that the volume be estimated.

The document is put forward as a tentative draft, a "skeleton" of what the final report will be. The committee plans to design a guide for sanitation officials in preparing their annual departmental reports. The committee is under no illusions concerning the size and difficulty of the task. It has made a good beginning. Let us hope it will be strong enough to carry out the whole task in a businesslike and practical manner. GEORGE A. SOPER

Practical Applications of Heredity —*By Paul Popenoe. Baltimore: Willliams & Wilkins,* 1930. Price, $1.00.

This little book is largely made up of essays which have already appeared in several more or less popular journals. The titles are all interesting. There are many anecdotes of well known geniuses as well as impostors, some of whom have assumed this rôle for profit and some from mental derangement.

The book is charmingly written and contains much practical advice.

M. P. RAVENEL

A Study Guide Text-book in the Principles and Practice of Nursing —*By Lulu K. Wolf. New York: Macmillan,* 1930. 139 pp. Price, $.70.

This book should prove a valuable aid to the busy instructor who has found the work of making out adequate sets of the new type questions both puzzling and time consuming. It is particularly good for the student to have the subject material covered by questions which are not in her instructor's own familiar phraseology.

Each set of tests seems especially well planned to impress the student with the necessity for definite clear cut facts rather than the vague impressions which sometimes pass for knowledge. The clever hints at several possibilities in many of the answers where only one may be used are stimulating to any reader (instructor included) to search for exactness in information.

A problem to be worked out by a study of suggested references is skillfully presented at the beginning of each lesson. References are clearly indicated.

There is a strong, splendid appeal in the paragraph which the author calls a "Foreword" following each problem. Instructors and executives who are aware of the difficulties met in placing serious responsibilities on youthful shoulders will find a frequent reading of these well-thought-out paragraphs both stimulating and inspiring.

There are numerous suggested graphs showing means of working out class relationship curves, etc., which some instructors are finding useful for creating a desire in their students for creditable rating. HARRIET E. DAVIS

Introduction to Human Parasitology —*By Asa C. Chandler, M.S., Ph.D. (4th ed.) New York: Wiley,* 1930. 655 pp. Price, $5.00.

This volume, rewritten and enlarged, supersedes the well known text, *Animal Parasites and Human Diseases,* by the same author.

A book which has been so long before the public and has been so favorably received by teachers as well as critics needs no comment further than to say that the new volume has been improved

in practically every way and brought up to date. It is an eminently practical book for the teacher as well as the practitioner.

The illustrations are good and abundant. The printing and binding are excellent. We know of no text on this general subject which can be as unhesitatingly recommended.

M. P. RAVENEL

Is It Safe to Work? A Study of Industrial Accidents—*By Edison L. Bowers. New York: Houghton Mifflin,* 1930. 229 pp. Price, $2.50.

Why is it that we, who have such a hatred for war, condone a continual battlefield in industry, where the casualties exceed those of war? Reliable authorities agree that 75 per cent or more of all accidents could be avoided. In brief, the book gives clear and practical suggestions for the prevention of accidents and discusses compensation, and the re-training of injured workers, all three of which subjects are insisted upon as related parts of one comprehensive program. The work is by a professor of economics who is also the author of the book *Compulsory Automobile Insurance.*

Gross injustices in our present workmen's compensation system exist, and scientific treatment of the injury problem has been made impossible because of the conditions surrounding the passage and administration of accident, compensation, and vocational rehabilitation legislation. The potential relationships between these three still remain for the most part unappreciated.

Each of the 14 chapters ends with a concise summary and conclusion, and the subject matter, which is commensurably rich in statistical evidences, takes up the workmen's compensation systems and schedules in the United States and foreign countries with special chapters devoted to the California and British Columbia Systems and another upon the American Rehabilitation System. The present death benefits are considered inadequate, which in itself causes serious problems, for which industry should be held responsible. The American safety movement and the fundamentals of accident prevention, with their relations to compensation laws and merit premium rating, comprise another chapter, while the two final chapters are devoted to "Outlines of a Permanent Partial Disability Schedule" and "Workman's Compensation or Limited Insurance?" Efforts to improve compensation must always have as their ultimate aim injury prevention. Safety is, after all, the real challenge to industry today. New methods and increased production demand that producers be held accountable for safety, and purchasers should pay the cost.

There is a set of notes for each chapter and an unusually replete bibliography classified under General Treatises, Accident Prevention, Workman's Compensation, and Rehabilitation.

The present work is a forcible presentation of the essentials, shortcomings, and possible solutions of the great "accident-compensation-rehabilitation" question. The material is fluently presented, the type is large and readable, and the subdivisions are logically captioned.

EMERY R. HAYHURST

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Measuring Municipal Sanitation—The Committee on Uniform Street Sanitation Records of the International Association of Street Sanitation Officials has published under date of September, 1930, a tentative draft of a report on the measurement and control of municipal sanitation. City administrators will find much valuable material here.

The need of measurement standards in municipal sanitation, measurements applied to sanitation activities, and records and cost accounting procedures are the major topics treated. In the words of the committee, the purpose of this manual is

> (a) To provide the sanitation administrator with the proper information to plan, supervise, and control the operations of his department, (b) to furnish him with a factual basis for preparing budget and appropriation estimates, (c) to supply him with a method of reporting his work to the public, and (d) to develop sufficient uniformity in reporting so that the administrator can compare his quantities, costs, and methods with those of other cities.

Pittsburgh County, Okla.—This very attractive annual report of 13 pages describes the work of the coöperative health unit in 1929 for this county of 1,370 square miles, with 50,778 population. There are 116 schools with an enrollment of 11,000. Disbursements amounted to $10,000.

There were 136 lectures given with an attendance of 1,311 in addition to 97 group conferences. Photographs illustrate the work being done to improve sanitary conditions. About half of the population have been inoculated with typhoid vaccine. There were 29 cases of typhoid and 24 cases of tuberculosis reported last year. The health department has 23 tuberculosis cases under supervision while 13 are in institutions. Prenatal conferences numbered 43, with an attendance of 150, while 114 home nursing visits were made to these cases. There were 354 babies examined in conferences and 133 home nursing visits made in behalf of these children. School work included 2,277 physical examinations.

Wood County, W. Va.—This is an interesting and well printed report of a county health department operating on a budget of 24 cents per capita. The milk supply is over 50 per cent pasteurized and is supervised by frequent inspections (350 dairy farms) and laboratory examinations. Nearly half of the 285 laboratory tests showed bacteria counts under 50,000 during the year. There are 20 retail dairy farms and 2 pasteurizing plants.

During the year 523 physical defects were corrected among school children, 700 persons were inoculated with typhoid vaccine, 600 were vaccinated, and 4,200 complete diphtheria toxin-antitoxin administrations were given.

Quincy, Mass.—The 1929 report is modelled, as heretofore, on the *Appraisal Form for City Health Work* of the American Public Health Association. A rating of 742 points compares with 712 in 1928. An organization chart prepares the reader for a clear understanding of the report of community health services.

There were 18 cases of diphtheria reported during the year with 2 deaths. As in previous years, prevention clinics were held weekly in various wards, and 3,700 children, half of whom were of school age, were immunized. In the child hygiene clinics there was a registration of 3,259, with an attendance of 7,154, besides 3,817 home visits by nurses in behalf of these children.

There were 397 visits made by children to the habit clinic with 737 visits to homes by the social worker.

Newton, Mass.—Careful preparation and good printing in readable type on dull coated paper characterize this health department report of 15 pages. A death rate of 9.8, based on a population of 58,758, with a birth rate of 14.9 and an infant mortality rate of 47.8 are statistical records worthy of note. Per capita expenditures amounted to 71 cents.

There were only 7 cases of diphtheria with 1 death. During the past 5 years there have been but 2 deaths from this disease. In each instance, the patient was not brought under treatment until the 3d or 4th day after onset. There were 367 kindergarten children immunized during the year. Approximately 96 per cent of the milk supply of the city is pasteurized.

Hartford, Conn.—On the basis of an estimated population of 176,318, a resident death rate of 10.4 and a birth rate of 17.5 are recorded in the 1929 report of the Board of Health. This city also reports an infant mortality rate of 71.1.

A detailed financial statement, classified by functions, shows total expenditures of $182,172, of which $82,520 were for the isolation hospital. Receipts amounted to $21,299, of which $16,251 were derived from the hospital. In common with the rest of New England, Hartford experienced a severe epidemic of respiratory disease and influenza in January. There were no deaths from typhoid or scarlet fever during the year. Diphtheria, measles, and whooping cough each yielded a death rate of 2 per 100,000. The death rate for tuberculosis was 77.1, compared with 71.9 in 1928, the 1929 rate among whites being 64.5 and among the colored, 400.

A juvenile tuberculosis clinic has been maintained at the Hartford Dispensary, at which 233 children received Mantoux tests and 174 physical examinations were made. The appraisal score for 1929 was 955 points out of a possible 1,400.

Springfield, Mass.—The birth rate for the year 1929 was 21.5 per 1,000 population, an increase of 1.5 over 1928. The crude death rate was 12.3 per 1,000; the infant mortality rate 54.5 per 1,000 births. The following specific death rates (per 100,000 population) were shown: tuberculosis 52, typhoid fever 0.6, diphtheria 1.5, measles 4.5, whooping cough 1.3, scarlet fever 0.6, heart disease 243, cancer 137.

Medical supervision is given to all the public and parochial schools in the city, except the high schools. The entire school system is provided with nurses, 64,620 school inspections having been made in 1929. Thirty-eight nutrition classes have been formed for children who are at least 8 lb. underweight for height and age. Six dental dispensaries are provided, so that all the school children in the three lower grades are receiving the necessary care and treatment of teeth. Children in the nutrition classes receive the necessary attention regardless of grades.

The per capita appropriation for health in Springfield is $1.38, as shown in the 1929 annual report. The department hospital receives 63 cents; 33 cents is used for medical inspection of school children.

Los Angeles County—A supplemental annual report of the Board of Supervisors deals with Public Health and Welfare Activities for the year ending June 30, 1929. Administrators will be particularly interested in the photographs and architect's plans of health centers which form an important part of the county health and welfare program.

It is our belief that the efficiency developed by grouping the health department, county welfare, school and other workers in the districts together under one roof has proven to be one of the greatest advances in service to the people performed by the County Government within recent years. We are happy to state that the Grand Jury report of 1928 and the survey conducted by the Bureau of Efficiency, assisted by the American Public Health Association, not only revealed no serious weakness in the department but strongly supported our policies and management.

Functional organization charts include personnel and salaries for each bureau and division of the health department. Extensive statistical tables accompany enlightening descriptive text. In the division of accounts is a business manager. A comprehensive report system is maintained showing the work performed in and costs to the 35 cities with whom contracts are made by the county department. Annual summary sheets are compiled showing the units of service and the costs for the various health districts. The Hollernith Division tabulates 63,000 cards monthly. There are 10 buildings owned by the County with approximately 65,000 square feet of floor space, besides 12 buildings rented with approximately 11,000 square feet, 28 other buildings in which the department is given the free use of 81 rooms, besides 33 rooms occupied in municipally owned buildings.

Functional studies of the city and county health expenditures of public and private agencies are tabulated to show a combined per capita total of $2.98, $1.60 by city agencies and $1.38 by county agencies. The county health department budget for the fiscal year was $1,092,691, of which $696,733 was for salaries, $200,530 for current expenses, $64,313 for outlay, and $131,115 for structural expenses.

Medical social service forms an important part of the work and many thousand contacts were made and interviews were held with health center cases during the year. Among other services, 2,150 cases were admitted for medical care, while 692 others were referred to physicians and dentists as not being eligible for treatment at the centers according to existing "Standards of Eligibility."

The personnel of the bureau of maternal and child hygiene consists of 39 full-time and 6 part-time trained physicians, dentists and assistants, exclusive of public health nursing supplied by a special bureau. There were 487 prenatal cases who made 2,571 clinic visits, while 52,044 infant and preschool visits were made to medical conferences. The services of this bureau may serve as an illustration of the activities of the health department described in the comprehensive report.

Connecticut—The 10th report of the Connecticut Public Health Council for the year ending June 30, 1929, occupies 476 pages of descriptive text, tables, charts and maps, and includes a full account of the successful New England Health Institute of 1928, when 1,200 were registered, and the Fiftieth Anniversary celebration of the Department. A classified statement of disbursements for the fiscal period July, 1928–June 30, 1929, shows total expenditures of $281,881.

The second lowest annual death rate of 11.1 is recorded for 1928, the rate for the previous year being 10.6. Typhoid fever (0.6), scarlet fever (1.4), diphtheria (5.3), and diarrhea and enteritis reached record low death rates. An average infant mortality rate of 65.6 for 4 years 1925–1928 contrasts with a rate of 142.8 for the 5 years 1900–1904. The major new activity was the survey of hospitals and their licensing as provided by a law passed in 1927. Fifteen hospitals were licensed for general use and 41 for chronic and convalescent care. The Division of Occupational Diseases has extended its services and

reporting of cases has increased considerably.

A tabular review of the Public Health Instruction Service indicates that during the year there were 280 film showings, 162 public addresses, 4,819 slides used, 35 strip film and 77 lantern showings, 811 posters displayed and 21 exhibits prepared.

The revised directory of nurses shows 3,552 on the list, 355 being engaged in general public health work in the State, 142 in school nursing, 119 in industrial nursing, 788 in institutions, and 1,718 in private duty nursing, among others. Of the 3,552, 713 are inactive or residing out of the State. Field supervision and advice is given by the Bureau of Public Health Nursing.

Well child conferences under state auspices number 58. At these conferences 3 kinds of services are rendered: (1) for very young children, a physical examination and advice to mothers; (2) for children about to enter school, a physical examination and particular advice about correction of defects before school begins; (3) for the 4 to 6 year-old children, the cleaning of the teeth and instruction and demonstration of their care. In certain localities, the dentists give their services, and at each child conference local physicians give their services in examining children. Reports of the various other bureaus and divisions, including laboratories, sanitary engineering, and mental hygiene, indicate an impressive volume of work which is interestingly described by the use of maps, tables and charts accompanying descriptive text.

White Plains, N. Y.—In the Health Conservation Contest of the U. S. Chamber of Commerce in 1929, White Plains was awarded first place among cities of 20,000 to 50,000 population. This 5th published annual report of the department reflects credit to the city and the staff for the health program which has been developed. In the words of the health officer, "as the years have passed, the ideals of preventive medicine have gradually become an accepted part of our community life." It is noteworthy that the Mayor "has attended all meetings of the Board and his advice has been graciously extended on many occasions."

On the basis of a population of 32,250, a death rate of 9.9, a birth rate of 21.9 and an infant mortality rate of 40 are recorded. The health of 403 infants, 337 preschool children and 166 expectant mothers was supervised in the health department clinics, while 6,479 school children were under the medical supervision of the Department of Education. Fifteen clinics were held in the spring and fall for the immunization of children against diphtheria (417) and vaccination against smallpox (157).

The budget of the health department amounted to $1.23 per capita. In addition, expenditures of the board of education for the health work amounted to 64 cents per capita, and those of the Nursing Association to 77 cents per capita. The Department of Charities expended $2.91 per capita for hospitalization and care of communicable disease, tuberculosis, maternity, psychopathic, and other types of cases. On the *Appraisal Form for City Health Work* the public health work of the city scored 812 out of a possible 1,000 points. The report of 71 pages is well illustrated with photographs and charts.

East Orange, N. J.—The new health building is effectively pictured on the cover of the 15th annual report of East Orange for 1929. This new health center was erected by the city as one of the units in its new Civic Center. A reproduction of the award of the U. S. Chamber of Commerce for the best accomplishments in health conservation in cities of 50,000 to 100,000

in 1929 features the first page. This is followed by an appraisal chart of health practices which shows a rating of 880 out of a possible 1,000 points, which compares with a score of 848 in 1928.

"The year gives us the smallest number of scarlet fever cases on record, there being only 73 cases reported. A reduction in the cases of diphtheria from 46 the year previous to 33 for this year, in spite of a high prevalence in neighboring communities, speaks for itself, emphasizing the importance of diphtheria immunization." Preschool immunizations against diphtheria increased from 569 to 706, two-thirds of the increase being accounted for by physicians in private practice.

This city, with a population of 70,888, records a birth rate of 12.7, 80 per cent of the births occurring in hospitals. Population, birth and death rates are analyzed by wards. A death rate of 9.5 is reported. Of special interest to administrators is a report of a prevalence study of venereal diseases which showed a rate of cases under treatment on a given day of 3.8 per 1,000 population, 2.3 for syphilis and 1.5 for gonorrhea. Adjustments based upon the annual turnover of these diseases raises the annual incidence to 8.9, 2.3 for syphilis and 6.6 for gonorrhea.

A tuberculosis death rate of 35 is recorded, as compared with 84 for the years 1915–1919. The tuberculosis control work of the city is carried on by the Anti-tuberculosis League of the Oranges and Maplewood. There were 68 cases reported in 1929, and 229 cases in the active file at the close of 1928. A special study of deaths among females for the years 1920–1929 fails to show the increase at ages 15–25 noted for the country as a whole. Of cases in sanatoriums, 32.4 per cent were in the incipient stage. The total patient days of 71 cases amounted to 13,056, with an average length of stay of 189 days.

An increase in laboratory analyses is noted since the health department moved into new quarters. During the year, 5,614 examinations were made in the city and other local laboratories. This comprehensive report, which is one of the best of the year, concludes with 7 recommendations by the health officer, a report of the finance committee showing an expenditure of $47,514, and a list of members of the board of health and the staff of the health department.

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SANDS, E. R. Inspection of Dairy Farms. Munic. San., 1, 10: 557 (Oct.), 1930.

Home Care of Cardiacs—Types of cardiac cases among children are classified and the nursing care of each class is considered.

SUTTON, L. P. Follow-up Care of Cardiac Children in the Home. Pub. Health Nurse, 22, 10: 503 (Oct.), 1930.

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TISDALL, F. F., *et al.* A New Cereal Mixture Containing Vitamins and Mineral Elements. Am. J. Dis. Child., 40, 4: 791 (Oct.), 1930.

School Child Health Administration—An inclusive discussion of sanitary, medical, and hygienic (personal) aspects of school health.

WILSON, C. C. School Health Education. J. Health & Phys. Ed., 1, 8: 12 (Oct.), 1930.

Water Treatment—A progress report covering modern methods of filtration, chlorination, taste and odor removal and laboratory control.

WOLMAN, A., *et al.* Recent Progress in the Art of Water Treatment. J. Am. Water Works A., 22, 9: 1161 (Sept.), 1930.

NEWS FROM THE FIELD

NATIONAL COMMITTEE FOR MENTAL HYGIENE OFFERS FELLOWSHIPS

TO assist in lessening some of the shortage of properly trained psychiatrists The National Committee for Mental Hygiene offers fellowships toward the acquisition of the special preparation required. Details of these fellowships can be had from Dr. Frankwood E. Williams, Medical Director, National Committee for Mental Hygiene, 370 Seventh Avenue, New York, N. Y.

INTERNATIONAL ASSOCIATION OF MILK DEALERS CONVENTION

THE International Association of Milk Dealers held its twenty-third annual convention at the Hotel Statler, Cleveland, O., October 20, 21 and 22.

The election of officers at the close of the convention returned Dr. F. D. Walmsley to the presidency of the association for another year. L. A. Van Bomel, president of Sheffield Farms Co., New York, N. Y., was reëlected vice-president; Dr. D. B. Peck of the Bowman Dairy Co., Chicago, Ill., was named treasurer again; and R. E. Little, of Chicago, was reëlected executive secretary.

NEW YORK SOCIETY FOR THE EXPERIMENTAL STUDY OF EDUCATION

THE Health Education Section of the New York Society for the Experimental Study of Education held its second dinner meeting at the Men's Faculty Club of Columbia University, New York, N. Y., November 14, 1930.

Dr. Percival M. Symonds, Chairman of the Mental Hygiene Committee of the White House Conference, addressed the group on needed research in Health Education.

INTERNATIONAL ASSOCIATION FOR THE PREVENTION OF BLINDNESS

THE International Association for the Prevention of Blindness held its annual meeting on Friday, October 10, at the Palais des Academies, Brussels, Belgium. Numerous ophthalmologists attended this meeting, and interesting national reports were made, dealing with the prevention of those diseases and accidents which lead to destruction or impairment of sight.

MISSOURI WATER AND SEWAGE CONFERENCE

THE Sixth Annual Meeting of the Missouri Water and Sewerage Conference was held in Columbia, Mo., October 23–24–25, 1930. The following officers were elected for the coming year: Chairman, J. N. Wells, Joplin; Vice-Chairman, E. E. Wolfe, Hannibal; and Secretary-Treasurer, H. D. Peters, Jefferson City. Executive Committee: R. L. Barker, Odessa; O. L. Hebbler, Higginsville; Hugh Brown, Vandalia, and W. J. Gray, Springfield.

AMERICAN JOURNAL OF CLINICAL PATHOLOGY

DR. T. B. Magath of the Mayo Clinic has accepted appointment as editor-in-chief of the new official journal of the American Society of Clinical Pathologists, the *American Journal of Clinical Pathology,* of which the first number will be issued in January 1931.

The new journal will emphasize new methods in laboratory work, the material being primarily of a practical and clinical nature. It is designed to be useful and serviceable to the technician as well as to the pathologist. For the present the journal will be published bimonthly.

DELTA OMEGA NEW OFFICERS

JOHN A. Ferrell, M.D., of the Rockefeller Foundation, New York, N. Y., was elected president of Delta Omega, the honorary public health society, at the annual meeting held in Fort Worth, Tex., October 29, 1930. Dr. Ferrell succeeds C. C. Young, D.P.H., of Lansing, Mich. Other officers elected were James A. Tobey, Dr.P.H., New York, as vice-president; and Professor Ira V. Hiscock of the Yale School of Medicine as secretary-treasurer. George W. McCoy, M.D., Director of the National Institute of Health, Washington, D. C., was elected an honorary member of the society.

Delta Omega now has 316 members, distributed in 6 chapters at the Johns Hopkins School of Hygiene and Public Health, Harvard School of Public Health, Massachusetts Institute of Technology, University of Michigan, Yale School of Medicine, and University of California. The honorary members of the society include President Hoover, Surgeon General H. S. Cumming, Charles V. Chapin, M.D., F. F. Russell, M.D., Sir Arthur Newsholme, W. S. Rankin, M.D., and S. Josephine Baker, M.D.

The society has made arrangements with the American Public Health Association for the reprinting of Dr. William Budd's classic work on typhoid fever, which first appeared in 1873.

NEGRO PUBLIC HEALTH NURSING

THAT the most urgent needs of the Negro public health nursing group are better fundamental training for the Negro nurse herself and a willingness on the part of whites to accord professional standing to her, are the chief findings of a preliminary survey of public health nursing by and for Negroes conducted under the auspices of the Julius Rosenwald Fund. Data for the survey were gathered by Marjorie Stimson, assistant director, and Louise Tattershall, statistician, of the National Organization for Public Health Nursing. A compilation by Stanley Rayfield is published in the current issue of *The Public Health Nurse*.

SWEDEN TO GET NEW DENTAL CLINIC

THE City of Stockholm, Sweden, has been offered $1,000,000 by George Eastman for the construction and equipping of a dental dispensary similar to the Rochester Dental Dispensary, according to announcement made by Dr. Harvey J. Burkhart, director of the Rochester Dental Dispensary.

GOVERNMENT HOSPITALS IN NEED OF MEDICAL OFFICERS, NURSES, AND SOCIAL WORKERS

A GOVERNMENT release states that government hospitals throughout the country, including those under the Veterans' Bureau, the Public Health Service, the Indian Service, and other branches, are in need of medical officers and nurses of various grades, and that Veterans' Bureau hospitals have vacancies in positions of psychiatric social worker and junior social worker.

CHILD LABOR DAY

CHILD Labor Day, the last Sunday in January, presents the opportunity for the people of any state to give thought once again to the conditions of child employment in their own community.

Any one interested in knowing more about child labor conditions can secure information from the National Child Labor Committee, 215 Fourth Avenue, New York, N. Y.

This Committee will send free of charge, to any interested reader, information with regard to child labor in any state together with literature, posters, plays and photographs.

A. N. A. BIRTHDAY

NEXT autumn, the American Nurses' Association will pass its thirty-fifth birthday anniversary. It is making extensive plans now for the observance of this milestone. A membership drive is planned, to commence in early January and to be concluded on the anniversary day, September 2, 1931. The January issue of the *American Journal of Nursing* will carry full plans for this campaign and there will be also a feature story telling of the growth of the A. N. A. from a little group of a score of women to a national organization with 86,000 members.

INTERNATIONAL ASSOCIATION OF DAIRY AND MILK INSPECTORS

THE 19th annual convention of the International Association of Dairy and Milk Inspectors was held in Cleveland, O., October 23, 24 and 25.

Officers elected for the ensuing year were: President, Dr. A. R. B. Richmond, Toronto, Ont.; First Vice-President, William B. Palmer, Orange, N. J.; Second Vice-President, Dr. Horatio N. Parker, Jacksonville, Fla.; Third Vice-President, Paul F. Krueger, Chicago, Ill.; Secretary-Treasurer, Dr. Paul B. Brooks, Albany, N. Y.

PREVENTION OF BLINDNESS CONFERENCE

THE 1930 annual conference of the National Society for the Prevention of Blindness was held at the Russell Sage Foundation Building, New York, N. Y., November 17–18. Special sessions included such topics as conservation of vision in school children, the relation of lighting to vision conservation, sight-saving class activities in America and medical social service in conservation of vision. A feature of this year's conference was the showing of a new two reel motion picture depicting some of the principal causes of blindness and explaining how they may be prevented. Announcement was made of the publication of the new *Sight-Saving Review*, Volume I, Number 1 of which will appear early in 1931.

A NEW METHOD OF MILK PRODUCTION

A NEW system of milk production, eliminating the human factor, was inaugurated at the Walker-Gordon Farm at Plainsboro, N. J., on November 13, 1930, when Thomas A. Edison pressed a button putting in operation a device known as a "rotolactor." This machine comprises a revolving platform with stanchions for 50 cows. As each cow takes her place on the platform, she is washed, dried, a little foremilk is taken for inspection, and then she is milked by machine. At the end of the revolution of the platform, which requires 12½ minutes, one cow steps off, and her place is taken by another. The milk is automatically transferred to a weighing machine, then conveyed through sterile pipes to the filling room, where it is bottled and capped by machine. The milking machines are rinsed and sterilized after each milking.

At the dedication of this new system, Governor Morgan Larson of New Jersey presided, and addresses were made by Secretary of Agriculture Arthur M. Hyde, Dr. Theobald Smith, Dr. Samuel J. Crumbine, and Henry W. Jeffers, president of Walker-Gordon Laboratories, who originated the rotolactor. About 4,000 persons, including many health officials and physicians, attended the ceremonies.

RECENT CHILD-WELFARE MEASURES IN ITALY

THE appropriation for the National Children's Bureau of Italy for the fiscal year, 1930–1931, has been raised to 65 million lire ($3,399,500), an increase of 35 million over the preceding year. The bureau is engaged in various phases of theoretical and practical child welfare work and maintains many child welfare institutions.—*La Medicina del Lavoro,* N. 2, 1930, p. 75.

NEW PSYCHIATRIC INSTITUTE

THE new Psychiatric Institute of the Grasslands Hospital at Valhalla, N. Y., will open in the near future. The building has a capacity of 82 beds and is modernly equipped.

TUMOR CLINIC

THE Jewish Hospital of Philadelphia will establish a research tumor clinic under the direction of Dr. Leon Solis-Cohen. The clinic will have for its object, not only the treatment of patients according to the best methods of the day, whether medical, radiological, electrical, surgical, or ether, but also and especially the study of the means of early recognition of the affection.

Dr. Joseph C. Doane, Medical Director of the hospital, will act as consulting physician, and on the advisory board. In addition, the members of the visiting staff of the Jewish Hospital will give their services as consultants in medicine, surgery, and the various specialties.

TRAINING OF FACTORY WELFARE WORKERS IN ITALY

A COURSE for the training of women to do welfare work in factories will be started on January 15, 1931, at the School of Social Work in Rome. The curriculum will include certain phases of law, economics, medicine, and hygiene, and methods of social service. The course will last one year.—*Le Assicurazioni Sociali,* Rome, 4: 186, 1930.

CHILD WELFARE WORK IN THE CITY OF GRAZ, AUSTRIA

THE organization of public child welfare work in the city of Graz is considered as one of the best outside of the capital. The central public authority for child welfare work is the municipal children's bureau, which has 21 branches throughout the city. The bureau has charge of all phases of child welfare work except education. Perhaps the most important part of this work is the guardianship of illegitimate children and legal aid to their mothers, particularly when it is necessary to obtain support from the child's father. Another branch of the bureau's work is the administration of poor relief in the cases of children and young persons under 18 years of age, including the serving of dinners.

At the health centers for expectant mothers maintained by the bureau, the women receive, in addition to medical advice, also gifts of money and clothing.

The bureau is also exercising supervision over wayward children through a staff of trained visitors, and it maintains institutions for such children; it is carrying out the probation work for the juvenile court and is in other ways cooperating with the court.

The municipal centers for children and young persons are also under the direction of the children's bureau; this includes the dental and orthopedic clinics, and clinics for the diseases of the ear, nose, and throat.

The bureau also maintains sanatoriums for tuberculous children and vacation homes for undernourished children, also a health center for expectant mothers, and coöperates with the six infant health centers existing in the city of Graz.—*Ztsch. f. Kinderschutz, Familien- und Berufsfürsorge,* Vienna, 8–9: 118, 1930.

The March of progress

Twenty years ago today

The theory was generally accepted that raw, unheated cow's milk was the best food for babies. Nothing was known of vitamins.

Ten years ago today

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